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OBSERVATIONS ON THE DISTRIBUTION AND ECOLOGY OF THE MAMMALS OF SALTA PROVINCE, ARGENTINA

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ABSTRACT

Distributional and ecological observations of mammals of Salta Province, Argentina, are summarized in this preliminary report. Data are presented which pertain to macro- and microhabitat preferences, molting, reproduction, and natural history, as well as standard external and cranial morphological measurements. Fifty-eight species belonging to 19 families and seven orders are considered in this paper; this represents 41% of the total mammal fauna of the province. Fieldwork was conducted over an 8-year period and included all major macrohabitats of the province (that is, Puna, Precordillera, Chaco, Moist Forest, and Transitional Forest). Species accounts are included, and the current status of all species occurring within the province is discussed. The ranges of two species (*Tadarida laticaudata* and *Auliscomys sublimis*) are extended.

INTRODUCTION

Salta Province is in extreme northwestern Argentina and lies between 22° and 26° south latitude and 62° and 66° west longitude (Fig. 1). The province encompasses more than 155,000 km² of a region that

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Fig. 1.—A map showing the position of Salta Province in South America. Its position along the Andean chain and astride the Tropic of Capricorn results in a great diversity of habitats occurring within the provincial boundaries.

is geologically, climatologically, and vegetationally diverse. In its eastern portion, the province supports thorn forest vegetation, or dry Chaco, on a vast flat plain. Temperatures in this area are high in summer (air temperature may exceed 50°C), which also coincides with the rainy season (for example, see Adamoli et al., 1972; A. L. Cabrera, 1976). Precipitation in this area varies from about 500 mm to 800 mm and increases from east to west (Fig. 2). Topographic relief also increases from east to west as the low eastern plain meets low-lying mountain ranges in the central portions of the province (with heights reaching

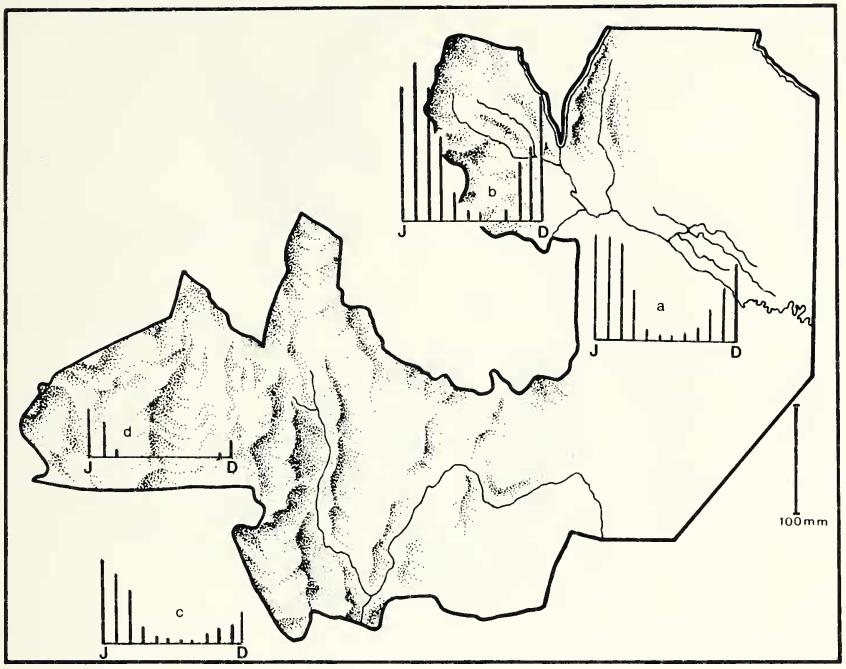

Fig. 2.—Rainfall within four major macrohabitats of Salta Province: a) a Chacoan locality (Rivadavia); b) a moist forest site (Orán); c) a Monte Desert site (Andalgalá, Catamarca Province); d) a Puna locality (San Antonio de los Cobres). Summer rainfall (October–March) predominates over the entire province.

approximately 1500 m). Continuing westward, taller ranges (with tops reaching 3000 m) are encountered, and still further west mountains reaching 5000 m form a geographic barrier to easterly winds. Finally, in the westernmost parts of the province, the Andean mountain chain, with peaks exceeding 6700 m, forms the western boundary of the province. Thus Salta offers an elevational gradient of more than 6000 m. As expected, climatic patterns are influenced by this varied topographic relief and are also complex, resulting in a mosaic of major vegetation communities including thorn scrub (or Chaco), moist forest, Monte Desert, and Puna (or high Andean steppe) (Fig. 3). Within each of these macrohabitats, there are several distinct vegetational associations, thus the province as a whole offers one of the richest areas on the continent from the viewpoint of habitat diversity.

Mammal investigations within Salta have largely been limited to collecting data of early naturalists and basic taxonomic studies (for example, Thomas, 1897, 1918, 1919; Yepes, 1944; Llanos, 1944; Romaña

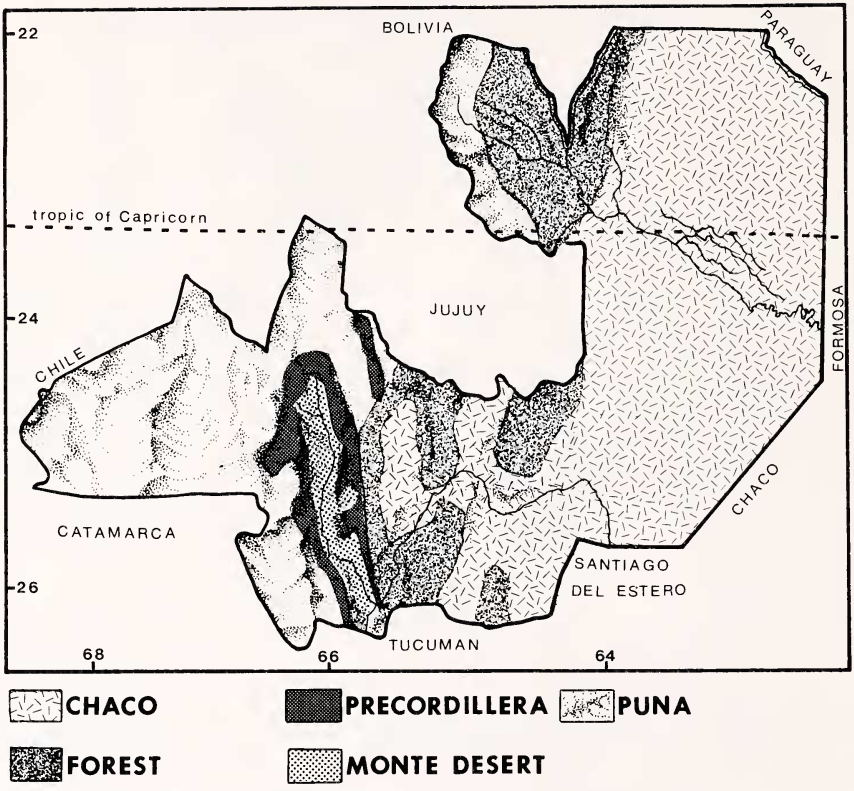

Fig. 3.—A simplified map of the vegetation of Salta Province, showing the five principal habitats: Chacoan thorn scrub; Forest (including both transitional and moist forests); Precordillera, which is found along montane slopes; Monte Desert, in the intermontane valleys of the west; and Puna, or high desert.

and Abalos, 1950; Olrog, 1958, 1959, 1976; Fornes and Massoia, 1967; Villa-R. and Cornejo, 1969), broad faunal surveys or taxonomic treatises (for example, Cabrera and Yepes, 1940; Cabrera, 1957, 1961; Pearson, 1958; Hershkovitz, 1962; Olrog, 1973), or studies dealing with the fauna of specific habitats which form major portions of the vegetation of Salta (for example, Mares, 1973, 1976).

We feel that it is particularly important to begin a survey of this ecologically complex region because, like most of South America, the flora and fauna of Salta are currently threatened by increasing industrialization and habitat modification (for example, Morello and Toledo, 1959*a*, 1959*b*; Aguerre and Quevedo, 1968). Indeed, it is precisely this

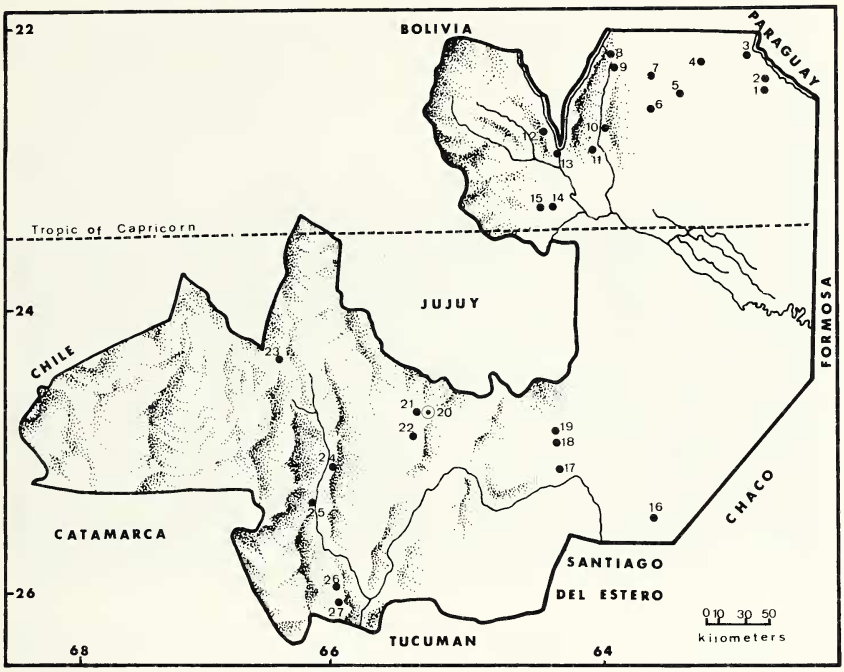

Fig. 4.—Map of the principal collecting localities within Salta Province. Often, more than one area was sampled at any major site. 1) 6 km SW of Santa Victoria, at "El Breal"; 2) Santa Victoria; 3) Santa María; 4) 5 km W of Jollin; 5) Yacimiento Tonono (Tonono Dos); 6) 27 km E Tartagal, along Tonono Rd.; 7) 8.4 km E Campo Durán; 8) Quebrada de Acambuco, 5 km W Dique Itiyuro; 9) 17 km SW beyond Dique Itiyuro; 10) 4 km S Pocoy; 11) 20 km W of General Ballivián, on Puerto Baules Rd.; 12) 24 km NW of Aguas Blancas; 13) Juntas de San Antonio; 14) 15 km S Orán, along Río Santa María; 15) 32 km SW Orán, along Río Santa María; 16) 5 km S of Tolloche, on La Viñita Rd.; 17) 3.7 km N of Ceibalito, and jct. of Anta Rd and Hwy 16; 18) 11 km N of Anta, on El Piquete Rd.; 19) 21 km N of Anta, on El Piquete Rd.; 20) Capital: Salta; 21) 12 km NW Salta, Quebrada de San Lorenzo; 22) INTA Station, Cerrillos; 23) 14 km S jct. Hwys 40 and 51, along Hwy 40 (4100 m); 24) Cachi; 25) 30 km S of Cachi, along Hwy 40; 26) 8 km N La Viñita, along Hwy 40; 27) Cafayate.

rapid encroachment of modern civilization throughout the province that has prompted this preliminary report and a more extensive report which will follow (Mares et al., in preparation). We hope to provide some baseline data on distribution and ecology of the mammals of Salta so that the inevitable changes in faunal distribution patterns that will occur in the near future will be discernible. We also hope to provide some information on a very poorly known fauna.

Fig. 5.—A natural lagoon at "El Breal" in extreme northeastern Salta Province (photograph taken at the end of the dry season). Species occurring in this area include *Molossops temminckii, Holochilus brasiliensis, Oryzomys nigripes, Akodon varius toba, Graomys griseoflavus, Pediolagus salinicola,* and *Lagostomus maximus*. The lagoon is heavily used by domestic livestock.

METHODS

General

Our research in Salta began when the senior author was engaged in an ecological study of the Monte Desert in early 1971. Trapping and survey work in the Monte led to explorations of adjacent mesic habitats. Field work in 1972 was sporadic and occurred principally in the Monte and in the subtropical forest north of Orán. In 1974, additional field work was done in the Monte and Puna of western Salta. Our most extensive period of field work was in 1976 (August–December), when we attempted to sample all major habitats of the province. In 1978 research was concentrated along the upper Río Tarija. Animals were collected by shooting or in traps (cage traps, museum special snap traps, 4-way rat-traps, gopher traps, and Sherman live traps). Bats were collected by mist netting over water or in forested areas. A total of 6130 trap nights was recorded during the course of this study, while 492 animals were collected.

Specimens were examined for reproductive condition in the field, or preserved in formalin for later laboratory analyses. Molting patterns were discerned by either examining flat skins for underlying melanin patterns (Barlow, 1969), or by utilizing a flow of compressed air to make new hair growth visible (Martin, 1973).

Fig. 6.—Part of the Chacoan Forest of extreme northeastern Salta near Santa Victoria. The characteristic "peladar" is evident, which is the area of hard-packed clay devoid of vegetation. A goat track is visible across the area, as is the browse line of the livestock. *Pediolagus salinicola* and *Lagostomus maximus* are common in this area.

Collecting Localities

An annotated list of our principal collecting localities is given below. Location of each collecting site is given in Fig. 4 and the accompanying Gazeteer; numbers below refer to sites listed in Fig. 4 and in the Gazeteer.

1. *El Breal.*—This site was located 6 km southwest of Santa Victoria along a small natural lagoon (Fig. 5). Vegetation is similar to site 2, but extensive areas of sand hummocks supporting xerophytic shrubs were present. The laguna is a center for bird aggregations including *Ajaia ajaja, Egretta thula, Ardea cocoi, Botaurus pinnatus, Jabiru mycteria, Chauna torquata,* and other species. During the dry season, which is the only time these sites are readily accessible due to flooding of primitive roads during the rainy season, domestic animals browse heavily on most natural vegetation.

2. *Santa Victoria* (Fig. 6).—This site is in extreme northeastern Salta near the border of Bolivia, Paraguay, and Argentina, and included the edges of the Río Pilcomayo. The area supports dry Chaco thorn forest with widely-spaced trees (*Acacia, Prosopis, Geoffroea*) on hard-packed soils (the "peladar" of Aguerre and Quevado, 1968). The area is heavily used for cattle and goat foraging. Human influences in the area are pronounced because of ranching activities and the activities of native Mataco and Toba Indians whose villages are situated along the river.

12–15. *Orán, Aguas Blancas-Juntas de San Antonio.*—These sites were all located

Fig. 7.—The Río Pescado in north-central Salta in the Moist Forest (photograph taken near the end of the dry season). Tapirs (*Tapirus terrestris*) occur in and along the river, and many mesic forest mammals (for example, *Lutreolina crassicaudata, Oxymycterus paramensis, Oryzomys legatus,* and *Leo onca*) are common in this area.

in the lower subtropical Moist Forest (Fig. 7). Forestry activities were being initiated in some sites in 1971, and by 1976 large areas of forest had been adversely affected. Banana plantations are common in the area, although most trapping was done in largely undisturbed forest, or in natural second growth areas along rivers or streams. At Juntas de San Antonio, the area sampled was impoverished and consisted of river floodplain supporting dense stands of willows (*Salix*).

16. *Tolloche.*—This site is in the extreme southwest of the province along the border with Santiago del Estero. The area is extremely dry and supports fairly dense Chaco forest. During the dry season, when we collected in the area, understory vegetation was practically nonexistent. Starving cattle were common in the area.

17–19. *Anta.*—This site was in central Salta. Various sites were trapped within this general area extending almost to the limits of the Parque Nacional El Rey and the Río Juramento. Most sites support transitional forest which has been greatly altered by cutting and ranching. Grazing activities of domestic animals have caused grassland portions of the Chaco in this region to be replaced by woody shrubs (Morello and Toledo, 1959*a*, 1959*b*).

23. *San Antonio de Los Cobres.*—The principal locality was situated at 3775 m elevation in the Puna. The high plateau is enclosed by Andean and pre-Andean ranges and is part of a fairly continuous region extending from Mendoza Province in Argentina to southern Peru. The climate is cold, with a mean annual temperature of 7.5°C; precipitation is low (103 mm annually at San Antonio de Los Cobres, A. L. Cabrera, 1976).

Fig. 8.—The puna above San Antonio de los Cobres, with the Nevado de Chañi (peak elevation 6200 m) in the background. The elevation of the plain in the foreground is approximately 4000 m. *Ctenomys opimus* and *Eligmodontia typus* occur in the shrubby areas.

The habitat is sandy in the flats with low scrub vegetation (Fig. 8). Common plants include *Adesmia horridiuscula* (Leguminosae), *Psila boliviensis* (Compositae), and *Fabiana densa* (Solanaceae) (A. L. Cabrera, 1957). One collecting site was at about 4500 m elevation.

24. *Cachi*.—This site is at 2280 m elevation in the southwestern portion of Salta Province and lies at the northernmost limit of the Monte Desert (Morello, 1958). *Prosopis, Larrea,* and *Acacia* comprise the dominant shrubs, while large cacti (*Trichocereus*) are also common.

27. *Cafayate*.—These sites were at 1660 m elevation in the Monte Desert in the valley of the Río Santa María (Fig. 9). Extensive *Prosopis* forests predominate in mesic localities, whereas *Larrea* forms the major vegetation on the bajadas. Tall cacti (*Trichocereus*) are common. The Cafayate area is one of the few Monte areas containing fairly extensive sand dunes. Annual rainfall is 228.3 mm (Morello, 1958); summers are wet and there is a winter drought.

CHECKLIST OF SALTA MAMMALS

The following list includes species comprising genera, families, and orders known or expected in Salta Province. The present status of each species is indicated as being: (i) introduced; (*) collected or seen by us in surveys; (c) common; (u) uncommon; (r) rare; (e) possibly in

Fig. 9.—The Monte Desert near Cafayate in Salta Province. Vegetation in this area consists primarily of *Cercidium praecox, Prosopis, Acacia,* and *Larrea cuneifolia.* This site is along the Río Calchaquies. *Microcavia australis, Eligmodontia typus,* and *Chaetophractus vellerosus* occur in flats, while *Phyllotis darwini* and *Graomys griseoflavus* are found on the slopes.

danger of extirpation; (+) probably extirpated; (p) possibly occurs in the province.

Order Marsupialia

Family Didelphidae	
Monodelphis fosteri	(r)
Marmosa constanciae	(r)
**Marmosa elegans*	(u)
**Marmosa pusilla*	(u)
**Lutreolina crassicaudata*	(u)
**Didelphis albiventris*	(c)

Order Chiroptera

Family Noctilionidae	
Noctilio labialis	(u)
Noctilio leporinus	(r)
Family Phyllostomidae	
Tonatia sylvicola	(r)

Glossophaga soricina	(p)
Phyllostomus discolor	(p)
Chrotopterus auritus	(r)
Anoura geoffroyi	(r)
**Sturnira lilium*	(c)
**Artibeus jamaicensis*	(c)
Artibeus lituratus	(u)
Pygoderma bilabiatum	(r)
**Desmodus rotundus*	(u)
Family Vespertilionidae	
**Myotis levis*	(c)
**Myotis nigricans*	(u)
**Myotis albescens*	(u)
Eptesicus brasiliensis	(u)
Eptesicus diminutus	(u)
**Eptesicus furinalis*	(u)
**Histiotus macrotus*	(r)
Histiotus montanus	(u)
**Lasiurus borealis*	(u)
**Lasiurus cinereus*	(u)
Lasiurus ega	(r)
Family Molossidae	
Molossops planirostris	(r)
**Molossops temminckii*	(c)
Molossops abrasus	(p)
Tadarida brasiliensis	(c)
Tadarida molossus	(p)
**Tadarida laticaudata*	(r)
Eumops auripendulus	(p)
**Eumops bonariensis*	(u)
Eumops glaucinus	(u)
Eumops perotis	(c)
Promops nasutus	(r)
Molossus ater	(u)
**Molossus molossus*	(u)
Order Primates	
Family Cebidae	
Alouatta caraya	(r)
Cebus apella	(r)
Order Edentata	
Family Myrmecophagidae	
Myrmecophaga tridactyla	(e)
**Tamandua tetradactyla*	(e)

Family Bradypodidae	
Bradypus boliviensis	(p)
Family Dasypodidae	
Chaetophractus nationi	(p)
**Chaetophractus vellerosus*	(c)
Chaetophractus villosus	(p)
**Euphractus sexcinctus*	(u)
Priodontes giganteus	(e)
Cabassous chacoensis	(p)
**Tolypeutes matacus*	(c)
**Dasypus novemcinctus*	(c)
Dasypus septemcinctus	(r)
Dasypus hybridus	(p)
Burmeisteria retusa	(e)
Order Lagomorpha	
Family Leporidae	
Lepus capensis	(i)
Sylvilagus brasiliensis	(u)
Order Rodentia	
Family Sciuridae	
Sciurus ignitus	(c)
Family Muridae	
**Oryzomys legatus*	(r)
Oryzomys concolor	(p)
**Oryzomys nigripes*	(c)
Rhipidomys leucodactylus	(r)
**Akodon andinus*	(r)
**Akodon boliviensis*	(c)
Akodon caenosus	(p)
**Akodon varius*	(c)
**Akodon albiventer*	(c)
Akodon jelskii	(p)
Bolomys lenguarum	(p)
**Oxymycterus paramensis*	(u)
Calomys lepidus	(r)
**Calomys laucha*	(r)
**Calomys callosus*	(c)
**Eligmodontia typus*	(u)
Phyllotis caprinus	(p)
**Phyllotis darwini*	(c)
Phyllotis osilae	(p)
**Auliscomys sublimis*	(r)

**Graomys domorum*	(r)
**Graomys griseoflavus*	(c)
Andinomys edax	(p)
Chinchillula sahamae	(p)
Euneomys fossor	(r)
Neotomys ebriosus	(r)
**Holochilus brasiliensis*	(c)
Rattus norvegicus	(i)
Rattus rattus	(i)
Mus musculus	(i)
Family Erethizontidae	
Coendou prehensilis	(r)
Family Caviidae	
**Microcavia australis*	(c)
Microcavia shiptoni	(r)
**Galea musteloides*	(c)
Cavia tschudi	(p)
**Pediolagus salinicola*	(c)
Family Hydrochoeridae	
**Hydrochoerus hydrochaeris*	(u)
Family Dasyproctidae	
**Dasyprocta punctata*	(u)
Family Chinchillidae	
**Lagostomus maximus*	(c)
**Lagidium viscacia*	(c)
Chinchilla lanigera	(+)
Family Myocastoridae	
Myocastor coypus	(r)
Family Octodontidae	
Octodontomys gliroides	(p)
Family Ctenomyidae	
**Ctenomys frater*	(u)
**Ctenomys mendocinus*	(c)
**Ctenomys opimus*	(c)
**Ctenomys saltarius*	(c)
Family Abrocomidae	
Abrocoma cinerea	(e)
Order Carnivora	
Family Canidae	
Canis culpaeus	(r-e)
Canis griseus	(p)
Canis gymnocercus	(c)
**Cerdocyon thous*	(c)

Family Procyonidae	
Procyon cancrivorus	(r)
**Nasua nasua*	(u)
Family Mustelidae	
Lyncodon patagonicus	(r)
Galictis cuja	(u)
**Eira barbara*	(r-e)
Conepatus chinga	(p)
Conepatus rex	(p)
Lutra platensis	(r-e)
Family Felidae	
Felis colocolo	(r-e)
Felis geoffroyi	(u)
Felis tigrina	(r-e)
Felis wiedii	(r-e)
Felis jacobita	(p)
**Felis yagouaroundi*	(u)
Felis pardalis	(p)
Felis concolor	(u)
**Leo onca*	(u)
Order Perissodactyla	
Family Tapiridae	
**Tapirus terrestris*	(r-e)
Order Artiodactyla	
Family Tayassuidae	
Tayassu pecari	(r)
**Tayassu tajacu*	(c)
Catagonus wagneri	(r)
Family Cervidae	
Mazama americana	(r-e)
**Mazama gouazoubira*	(c)
Hippocamelus antisensis	(r-e)
Blastoceros dichotomus	(+)
Ozotoceros bezoarticus	(+)
Family Camelidae	
**Lama guanicoe*	(r-e)
**Lama glama*	(c)
Vicugna vicugna	(r-e)

The species Accounts which follow include the order and family of each species, as well as its scientific name followed by the authority

and literature citation for the binomial. The Spanish common name (after Olrog, in press) and the English common name follow. In some cases, we were unable to find acceptable English common names, so we have either translated the Spanish name directly, or included a descriptive English common name which we have coined for this report. All measurements are in mm, while weight is given in grams. Specimens from the Quebrada de Acambuco are housed in the collection of mammals at the Instituto Miguel Lillo in San Miguel de Tucumán, Argentina. All other specimens are in the collection of mammals of the Carnegie Museum of Natural History in Pittsburgh. Two localities to which we commonly refer are the Río Pescado, which is located about 24 km NW of Aguas Blancas in the Departamento de Orán, and the INTA (Instituto Nacional de Tecnología Agropecuaria) station in Cerrillos, near the capital city of Salta. We visited 27 principal collecting localities, but at times traps were set at more than one site within each principal locality. Thus we trapped at a total of 45 locations across the province.

ACCOUNTS OF SPECIES

Order Marsupialia

Family Didelphidae

Marmosa elegans (Waterhouse)
marmosa elegante — elegant mouse opossum

1839. *Didelphis elegans* Waterhouse, Zool. Beagle, Mamm.:95.
1894. *Marmosa elegans* Thomas, Ann. and Mag. Nat. Hist., ser. 6, 14:188.

Specimens examined (5).—CAPITAL: Quebrada de San Lorenzo, 12 km NW Salta, 1. GENERAL SAN MARTIN: 27 km E Tartagal, along Tonono Rd., 1. ORAN: Juntas de San Antonio, 1; 24 km NW of Aguas Blancas, 2.

Measurements.—One ♂: total length, 251; tail, 142; hind foot, 14.5; ear, 24.6; weight, 41. Cranial measurements (1 ♂): greatest length of the skull, 29.9; condylobasal length, 29.9; zygomatic breadth, 16.2; breadth of braincase, 11.1; least interorbital breadth, 5.3; palatal length, 15.8; length of maxillary toothrow, 9.8; length of mandibular toothrow, 10.7.

Remarks.—Mouse opossums are not common anywhere in Salta, though they are easiest to catch in the moist forest of the north. Specimens in northern Salta were taken under clumps of bamboo (*Chusquea*) from burrows located within the dense cane patches. Other animals were taken under logs near streams, and on the littered floor of second growth forest. One individual was caught from a burrow in the rocky embankment of the Río Pescado.

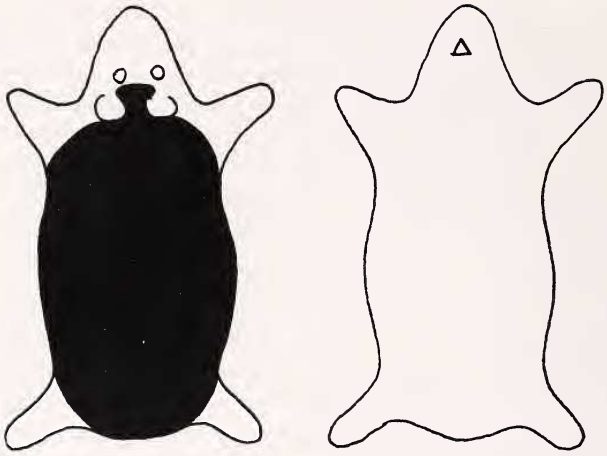

Fig. 10.—Diagram of the full dorsal molt of a *Marmosa pusilla* taken near Cachi in April, during the late autumn. No melanin deposits were evident ventrally.

Marmosa pusilla (Desmarest)
marmosa común — common mouse opossum

1804. *Didelphis pusilla* Desmarest, Nouv. Dict. d'Hist. Nat., 24:19.
1914. *Marmosa pusilla* Bertoni, Fauna Parag., p. 69.

Specimens examined (3).—ANTA: 5 km S of Tolloche, on La Viñita Rd., 1. CACHI: 30 km E of Cachi, 2.

Measurements.—One ♂ and two ♀♀, respectively: total length, 170, 170, 187; tail, 90, 90, 99; hind foot, 11.5, 13.2, 12.3; ear, 24.1, 23.0, 22.0; weight, 13.3, 15.3, 18. Cranial measurements of 1 ♂: greatest length of the skull, 24.4; condylobasal length, 23.9; zygomatic breadth, 12.5; least interorbital breadth, 3.9; breadth of braincase, 10.2; length of maxillary toothrow, 8.6; length of mandibular toothrow, 8.9; breadth across canines, 2.2; breadth across last molars, 4.8.

Remarks.—This species is less common than *M. elegans* and inhabits much drier localities. The specimens near Cachi were taken from a steep, rocky xeric hillside, whereas the specimen from Tolloche was collected in very dry thorn scrub. *Marmosa pusilla* is widespread throughout the arid parts of Salta but is never common, nor is its presence easy to predict. The Cachi specimens were in full molt dorsally (Fig. 10).

Lutreolina crassicaudata (Desmarest)
comadreja colorada — little water opossum

1804. *Didelphis crassicaudata* Desmarest, Nouv. Dict. d'Hist. Nat., 24:19.
1923. *Lutreolina crassicaudata* Thomas, Ann. and Mag. Nat. Hist., ser. 9, 11:584.

Fig. 11.—The little water opossum, *Lutreolina crassicaudata,* captured along the Río Pescado in north-central Salta. The weasel-like body form is evident.

Specimens examined (2).—ORAN: 24 km NW of Aguas Blancas, 2.

Measurements.—One ♂ and one ♀, respectively: total length, 501, 452; tail 262, 255; hind foot, 40.4, 35.8; ear, 25.6, 24.8; weight, 260, 176. Cranial measurements of the female: greatest length of the skull, 55.5; condylobasal length, 56.0; zygomatic breadth, 27.5; least interorbital breadth, 7.7; breadth of braincase, 16.8; palatal length, 31.1; length of maxillary toothrow, 19.3; length of mandibular toothrow, 17.6; breadth across canines, 5.3; breadth across last molars, 9.7.

Remarks.—This weasel-like opossum (Fig. 11) is probably widespread throughout the mesic forests of Salta and occurs as far south as San Miguel de Tucumán, Tucumán Province. The animals are most common along small quiet brooks in dense forest.

Didelphis albiventris Lund
comadreja común — opossum

1841. *Didelphis albiventris* Lund, Kongl. Dansk. Vid. Selsk. Afhand., 8:236.

Specimen examined (1).—RIVADAVIA: 6 km SW Santa Victoria, at "El Breal," 1.

Measurements.—One ♀: total length, 617; tail, 322; hind foot, 48.5; ear, 56.8; weight, 1900. Cranial measurements: greatest length of the skull, 83.8; condylobasal length,

83.0; zygomatic breadth, 40.8; least interorbital breadth, 10.1; breadth of braincase, 23.1; palatal length, 50.6; length of maxillary toothrow, 29.7; length of mandibular toothrow, 32.2; breadth across canines, 10.4; breadth across last molars, 5.6.

Remarks.—Opossums are common throughout Salta Province in forests, along river valleys, and in agricultural areas. They do not frequent areas which are very dry or which are at high elevations. The animals are heavily hunted throughout the province for their skins; they are not eaten.

Order Chiroptera

Family Phyllostomatidae

Sturnira lilium (Geoffroy)
falso vampiro flor de lis — yellow-shouldered bat

1810. *Phyllostoma lilium* Geoffroy, Ann. Mus. Paris, 15:181.
1855(1856) *Sturnira lilium* Gervais, Exped. Castelnau. Zool.:39.

Specimens examined (34).—GENERAL SAN MARTIN: Quebrada de Acambuco, 5 km W Dique Itiyuro, 1. ORAN: Juntas de San Antonio, 17; 24 km NW of Aguas Blancas, 16.

Measurements.—Mean and range of 10 ♂♂ and 10 ♀♀, respectively: total length, 60.5 (53–67), 58.1 (48–65); hind foot, 11.9 (10.5–14.3), 11.8 (10.5–17.7); ear, 18.2 (16.3–19.5), 17.9 (16.8–18.6); forearm, 42.8 (40.3–46.1), 43 (39.4–47.2); weight, 22.5 (15.3–26), 19.8 (14.1–25).

Remarks.—This is one of the most common bats in mesic areas of Salta. All specimens taken near Aguas Blancas in July (dry season) were reproductively active with testes length averaging 3.8 mm in length (range 2.5–5.3 mm). Two of 10 females were lactating. The male taken in November in Acambuco had testes measuring 4.2 mm in length.

Artibeus jamaicensis Leach
falso vampiro grande — Jamaican fruit bat

1821. *Artibeus jamaicensis* Leach, Trans. Linn. Soc., 13:75.

Specimens examined (16).—ORAN: Juntas de San Antonio, 13; 15 km S Orán, along Río Santa María, 3; 22 km SW Orán, along Río Santa María, 1.

Measurements.—Mean and range for six individuals (all adults; three ♂♂ and three ♀♀): head and body length, 86.8 (83–90); tail, 0; hind foot, 16.9 (15.9–18.1); ear, 24.4 (22.9–25.6); forearm, 66.6 (63.6–68.6); weight, 53.3 (45–60). Cranial measurements (two ♀♀): greatest length of the skull, 29.0, 29.9; condylobasal length, 26.3, 28.0; zygomatic breadth, 18.5, 19.4; breadth of braincase, 15.7, 15.6; least interorbital breadth, 7.2, 7.7; palatal length, 14.7, 15.1; length of mandibular toothrow, 10.8, 11.5; length of maxillary toothrow, 7.8, 9.5; breadth across canines, 3.8, 4.5; breadth across last molars, 6.5, 7.2.

Remarks.—This is another very common bat in mesic portions of Salta and is the most common large fruit-eating bat.

Desmodus rotundus (Geoffroy)
vampiro de Azara — vampire

1810. *Phyllostoma rotundum* Geoffroy, Ann. Mus. Paris, 15:181.
1901. *Desmodus rotundus* Thomas, Ann. and Mag. Nat. Hist., ser. 7, 8:194.

Specimen examined (1).—GENERAL SAN MARTIN: Quebrada de Acambuco, 5 km W Dique Itiyuro, 1.

Measurements.—One ♂: total length, 95; hind foot, 16.2; ear, 20.2; forearm, 62; weight, 35.

Remarks.—Vampires are not common anywhere within the province of Salta, although they may occur with some frequency in the southeastern parts of the province in areas where many cattle and goats are kept. The reproductively active male taken in November had testes measuring 9.7 mm in length.

Family Vespertilionidae

Myotis nigricans (Schinz)
murciélago castaño — black Myotis

1821. *Vespertilio nigricans* Schinz, Thierr., 1:179.
1897. *Myotis nigricans* Miller, North American Fauna, 13:74.

Specimen examined (1).—ORAN: 15 km S Orán, along Río Santa María, 1.

Measurements.—One ♂: total length, 78; tail, 35; hind foot, 7.1; ear, 13.7; forearm, 34.5. Cranial measurements: greatest length of the skull, 12.9; condylobasal length, 12.7; zygomatic breadth, 8.2; least interorbital breadth, 3.6; breadth of braincase, 6.2; palatal length, 7.0; length of maxillary toothrow, 4.1; length of mandibular toothrow, 4.9; breadth across canines, 2.2; breadth across last molars, 2.7.

Remarks.—This small bat probably occurs uncommonly throughout the province, although it is most common in mesic areas of the central forested region.

Myotis albescens (Geoffroy)
murciélago blancuzco — hoary Myotis

1806. *Vespertilio albescens* Geoffroy, Ann. Mus. Paris, 8:204.
1900. *Myotis albescens* Thomas, Ann. Mus. Civ. Genova, 40:546.

Specimens examined (2).—ORAN: 22 km SW Orán, along Río Santa María, 1. RIVADAVIA: 6 km SW Santa Victoria, at "El Breal," 1.

Measurements.—One ♂ and one ♀, respectively: total length, 85, 82; tail, 35, 37; hind foot, 8.7, 7.6; ear, 14.6, 13.1; forearm, 34.9, 35.7; weight, 7.5, 6.2. Cranial measurements (one ♂): greatest length of the skull, 13.3; condylobasal length, 12.6; breadth of braincase, 7.0; least interorbital breadth, 4.0; palatal length, 5.2; length of maxillary toothrow, 4.5; length of mandibular toothrow, 4.8; breadth across canines, 2.6; breadth across last molars, 2.7.

Remarks.—This is an uncommon *Myotis* in Salta and probably occurs primarily in the northern lowlands.

Eptesicus furinalis (D'Orbigny)
murciélago parduzco — brown bat

1847. *Vespertilio furinalis* D'Orbigny, Voy. Amer. Merid., 4:13.
1920. *Eptesicus furinalis* Thomas, Ann. and Mag. Nat. Hist., ser. 9, 5:365.

Specimens examined (5).—GENERAL SAN MARTIN: Quebrada de Acambuco, 5 km W Dique Itiyuro, 5.

Measurements.—Mean and range for five individuals (three ♂♂ and 2 ♀♀): total length, 95.3 (86–103); tail, 38.6 (32–43); hind foot, 7.3 (7.0–8.0); ear, 15.6 (15.1–16.0); forearm, 39.9 (37.4–40.8); weight, 9.3 (8–11).

Remarks.—This is an uncommon bat in Salta and probably occurs throughout the province in the lowlands and low mountains supporting forest vegetation. The five specimens taken in November (the rainy season) were all molting and none was breeding. Male testes (abdominal) were 4.4 and 4.8 mm in length in two specimens. All specimens were molting over the entire body with melanin visible under all parts of the skin.

Histiotus montanus (Philippi and Landbeck)
murciélago orejón chico — small big-eared bat

1861. *Vespertilio montanus* Philippi and Landbeck, Arch. Naturg.:289.
1907. *Histiotus montanus* Miller, Bull. U.S. Nat. Mus., 57:214.

Specimens examined (3).—GENERAL SAN MARTIN: Quebrada de Acambuco, 5 km W Dique Itiyuro, 3.

Measurements.—One ♂ and one ♀, respectively: total length, 117, 117; tail, 57, 55; hind foot, 8.3, 8.8; ear, 34.7, 34.8; forearm, 47.5, 47.2; weight, 11, 13.

Remarks.—This uncommon big-eared insectivorous bat is probably widely distributed throughout the province. A female taken in November was lactating, whereas a male taken at the same time had abdominal testes measuring 4.4 mm in length. One specimen was molting over 60% of its body.

Lasiurus borealis (Müller)
murciélago peludo rojizo — red bat

1776. *Vespertilio borealis* Müller, Natursyst. Suppl.:20.
1901. *Lasiurus borealis* Thomas, Ann. and Mag. Nat. Hist., ser. 7, 8:435.

Specimens examined (2).—GENERAL SAN MARTIN: Quebrada de Acambuco, 5 km W Dique Itiyuro, 1. ORAN: 15 km S Orán, along Río Santa María, 1.

Measurements.—One ♂ and one ♀, respectively: total length, 106, 102; tail, 47, 54; hind foot, 8.9, 7.8; ear, 11.3, 14.7; forearm, 37.8, 41.1; weight, 8.5, 10.

Remarks.—Red bats are regular, but uncommon, throughout Salta Province, particularly in the central low mountain areas. One of the specimens evidenced molting on the head.

Lasiurus cinereus Beauvois
murciélago blancuzco — hoary bat

1796. *Lasiurus cinereus* Beauvois, Cat. Rais. Mus. Mr. C. W. Peale, Philadelphia-Paris:18.

Specimen examined (1).—GENERAL SAN MARTIN: Quebrada de Acambuco, 5 km W Dique Itiyuro, 1.

Measurements.—One ♂: total length, 130; tail, 63; hind foot, 9.4; ear, 17.1; forearm, 54.5; weight, 20.5.

Remarks.—This is an uncommon species in Salta but probably resembles the red bat in its pattern of occurrence. The specimen was molting (internal melanin deposits) over 60% of its body (captured in November).

Family Molossidae

Molossops temminickii (Burmeister)
moloso pigméo — Temminck's free-tailed bat

1854. *Dysopes temminickii* Burmeister, Sys. Uebers. Thiere Brasil:72.
1907. *Molossops temminckii* Miller, Bull. U.S. Nat. Mus., 57:248.

Specimens examined (21).—GENERAL SAN MARTIN: Quebrada de Acambuco, 5 km W Dique Itiyuro, 1. RIVADAVIA: 6 km SW of Santa Victoria, at "El Breal," 21.

Measurements.—Mean and range for five ♂♂ and five ♀♀, respectively: total length, 72.8 (70–76), 73.2 (68–75); tail, 24.6 (21–27), 25.6 (22–28); hind foot, 6.2 (5–6.9), 6.6 (6.4–6.7); ear, 12.1 (7.8–13.6), 12.8 (11.5–13.6); forearm, 30.6 (29.6–31.3), 30.5 (29.6–31.8); weight, 5.6 (5.2–6.5), 5.4 (5–5.6). Cranial measurements (two ♀♀): greatest length of the skull, 13.3, 13.6; condylobasal length, 13.0, 13.0; least interorbital breadth, 3.6, 3.5; breadth of braincase, 6.8, 6.7; palatal length, 6.4, 6.7; length of maxillary toothrow, 3.9, 4.5; length of mandibular toothrow, 4.3, 4.6; breadth across canines, 2.0, 1.9; breadth across last molars, 3.6, 3.4.

Remarks.—This is a common bat in the eastern lowlands of the province in Chaco vegetation, particularly if free water is nearby. The specimens taken at Santa Victoria were caught just before sunset and many bats were flying at least one hour prior to sunset. They appeared to fly in groups and were apparently foraging for insects along the edge of a saline lake. One specimen taken in November in Acambuco (the rainy season) was molting and carried one embryo.

Tadarida laticaudata Geoffroy
moloso colilargo — broad-tailed molossid

1805. *Tadarida laticaudata* Geoffroy, Ann. Mus. Paris, 6:156.

Specimen examined (1).—ORAN: 22 km SW Orán, along Río Santa María, 1.

Measurements.—One ♂: total length, 116; tail, 53; hind foot, 9.8; ear, 20.6; forearm, 46.7; weight, 14.

Remarks.—This is a very uncommon free-tail bat that probably occurs sporadically over most of the lower elevation habitats of central Salta. The only specimen we captured was taken over water in a lush area of mixed forest and orchards. This also represents an extension of its known range within Argentina (see Barquez and Ojeda, 1975).

Eumops bonariensis (Peters)
moloso orejiancho — small mastiff bat

1874. *Promops bonariensis* Peters, Monatsb. Preuss. Akad. Wiss. Berlin:232–234.
1916. *Eumops bonariensis* Osgood, Field Mus. Publ., Zool., 10:214.

Specimens examined (2).—GENERAL SAN MARTIN: Quebrada de Acambuco, 5 km W Dique Itiyuro, 1; ORAN: 15 km S Orán, along Río Santa Mariá, 1.

Measurements.—One ♂ and one ♀, respectively: total length, 99, 122; tail, 35, 51; hind foot, 8.0, 9.1; ear, 19.8, 15.1; forearm, 43.8, 47.2; weight, 11.5, 19. Cranial measurements (one ♂): greatest length of the skull, 17.7; condylobasal length, 16.3; zygomatic breadth, 10.5; least interorbital breadth, 4.0; breadth of braincase, 9.1; palatal length, 6.5; length of maxillary toothrow, 4.9; length of mandibular toothrow, 6.0.

Remarks.—The female taken in November was pregnant with a 3 g fetus. Neither specimen was molting. This species probably occurs over much of central Salta, though it is uncommon in all areas.

Molossus molossus (Pallas)
moloso coludo — velvety free-tailed bat

1766. *Vespertilio molossus* Pallas, Misc. Zool. Hagae Comitum., 12:49.
1805. *Molossus molossus* Geoffroy, Ann. Mus. Hist. Nat. Paris, 6:151.

Specimens examined (2).—GENERAL SAN MARTIN: Quebrada de Acambuco, 5 km W Dique Itiyuro, 2.

Measurements.—One ♂ and one ♀, respectively: total length, 103, 101; tail, 36, 37; hind foot, 9.0, 7.8; ear, 15.1, 14.7; forearm, 38.0, 38.4; weight, 13, 15.

Remarks.—The female was pregnant and lactating at the same time (captured in November). This is an uncommon bat throughout the province, but probably occurs over much of the central lowlands and valleys, although there is always a good possibility that this and several other "uncommon" species are actually rather widespread and common, but are difficult to catch.

Order Edentata

Family Myrmecophagidae

Tamandua tetradactyla (Linné)
oso melero — tamandua

1758. *Myrmecophaga tetradactyla* Linné, Syst. Nat.:35.
1825. *Tamandua tetradactyla* Gray, Annal. Philos., 10:343.

Specimen examined (1, skin only).—Santa María (extreme NE Salta), 1.

Measurements.—No measurements available.

Remarks.—This anteater is fairly common over the eastern half of Salta where it is heavily hunted for its hide. The single specimen we examined had been taken in very dry thorn scrub along the northeastern border of Salta. The coloration of our specimen is golden yellow with black stripes extending from the anterior portion of the forelimbs to the back.

Family Dasypodidae

Chaetophractus vellerosus Gray
quirquincho chico — little hairy armadillo

1865. *Dasypus vellerosus* Gray, Proc. Zool. Soc. London:376.
1928. *Chaetophractus vellerosus* Yepes, Rev. Univers. Buenos Aires, ser. 2, 1:500.

Specimens examined (1 complete and 2 shells).—GENERAL SAN MARTIN: 8.4 km E Campo Durán, 1. RIVADAVIA: near Santa Victoria (extreme NE Salta), 2.

Measurements.—One ♂: total length, 328; tail, 106; hind foot, 49.0; ear, 31.5; weight, 760.

Remarks.—This is a very common armadillo in Salta in the eastern thorn scrub lowlands. It is also common in some of the high mountains as well as the valleys of the Monte Desert and is most frequently noted by its numerous burrows. It probably occurs in all major habitats of Salta with the possible exception of the highest Puna. It is not common in moist forests. Individuals are heavily hunted with dogs for their shells, which are used in making small guitars, or *charangos,* as well as for food. They are regarded as a delicacy.

Euphractus sexcinctus (Linné)
gualacate — six-banded armadillo

1758. *Dasypus sexcinctus* Linné, Syst. Nat.:51.
1911. *Euphractus sexcinctus* Thomas, Proc. Zool. Soc. London:141.

Specimens examined (2, shells only).—GENERAL SAN MARTIN: Yacimiento Tonono (Tonono 2), E of Tartagal, 1. RIVADAVIA: near Santa Victoria (extreme NE of Salta), 1.

Measurements.—No measurements available.

Remarks.—Like other armadillos, *Euphractus* are heavily hunted for food. In eastern Salta, the Mataco and Toba Indians use *Euphractus* tails to carry fibers which are easily ignited after striking the shells of the tail with a flint, thus serving as a "cigarette lighter." *Euphractus* are regular, but uncommon, over the eastern half of the province.

Tolypeutes matacus (Desmarest)
quirquincho bola — three-banded armadillo

1804. *Loricatus matacus* Desmarest, Nouv. Dict. Hist. Nat.:28.
1919. *Tolypeutes matacus* Osgood, J. Mamm., 1:33.

Specimens examined (5, shells only).—GENERAL SAN MARTIN: 4 km S Pocoy, 2; Yacimiento Tonono (Tonono 2), E of Tartagal, 2. RIVADAVIA: 5 km W of Jollin, 1.
Measurements.—No measurements available.

Remarks.—This may be the most common armadillo in the eastern lowlands of Salta where it coexists with *Chaetophractus, Euphractus,* and *Priodontes*. Like the other armadillos, *Tolypeutes* is hunted for food. Its shells are also used as regional artifacts throughout the northwest.

Dasypus novemcinctus Linné
mulita grande — nine-banded armadillo

1758. *Dasypus novemcinctus* Linné, Syst. Nat.:51.

Specimen examined (1, shell only).—ORAN: 15 km S Orán, along Río Santa María, 1.
Measurements.—No measurements available.

Remarks.—This armadillo is commonly found in heavily forested areas of Salta, particularly in lowland mesic areas. It is hunted and eaten.

Order Rodentia

Family Cricetidae

Oryzomys legatus Thomas
colilargo acanelado — large-headed rice rat

1925. *Oryzomys legatus* Thomas, Ann. and Mag. Nat. Hist., ser. 9, 15:575.

Specimens examined (6).—GENERAL SAN MARTIN: 17 km SW beyond Dique Itiyuro, 1. ORAN: 24 km NW Aguas Blancas, 5.
Measurements.—Mean and range for one ♂ and four ♀♀: total length, 273.6 (255–286); tail, 148.8 (140–155); hind foot, 33.3 (32.7–34.0); ear, 24.9 (24.1–25.8); weight, 55.2 (43–80). Cranial measurements: greatest length of the skull, 34.0 (33.4–35.2); condylobasal length, 33.4 (32.6–34.7); zygomatic breadth, 17.6 (17.3–18.4); least interorbital breadth, 5.9 (5.7–6.3); breadth of braincase, 13.0 (12.8–13.4); palatal length, 16.6 (16.4–16.9); length of maxillary toothrow, 5.2 (5.0–5.3); length of mandibular toothrow, 5.5 (5.4–5.5); diastema length, 8.5 (8.2–8.7).

Remarks.—This is the largest *Oryzomys* in Salta and occurs only in mesic forests and transitional forests in the north-central portion of the province. They are not abundant in any area but are most common in littered forested areas supporting little undergrowth where they inhabit burrows in the forest floor. Some specimens were also taken in dense second growth vegetation along streams and roads, as well as from the rocky banks of the Río Pescado. The species reaches its southern limit in Salta.

The testes of a specimen taken in northern Salta at Itiyuro in September were inguinal and measured 8.6 mm in length. We follow Mas-

soia (1974) in the specific classification of these populations. See also Gardner and Patton (1976) for the synonymy of this species with *O. nitidus*.

Oryzomys nigripes (Olfers)
colilargo común — common rice rat

1818. *Mus nigripes* Olfers, Eschwege Neue Bibl. Reisenbr., 51:209.
1959. *Oryzomys nigripes* Hershkovitz, Jour. Mamm., 40, 3:339.

Specimens examined (26).—ANTA: 21 km N Anta, on El Piquete Rd. along Río del Valle, 2. CERRILLOS: INTA Station, 9. GENERAL SAN MARTIN: 17 km SW, beyond Dique Itiyuro, 2; 20 km W General Ballivián, on Puerto Baulés Rd., 1. ORAN: Juntas de San Antonio, 3; 24 km NW Aguas Blancas, 1. RIVADAVIA: 6 km SW Santa Victoria, at "El Breal" (extreme NE Salta), 8.

Measurements.—Mean and range for three ♂♂ and four ♀♀: total length, 213.7 (181–242); tail, 128.4 (113–150); hind foot, 24.7 (22.9–26.2); ear, 18.9 (17.0–21.6); weight, 21.4 (13.5–29.5). Cranial measurements: greatest length of the skull, 24.9 (23.0–27.8); condylobasal length, 22.2 (20.4–24.5); zygomatic breadth, 13.1 (12.3–15.0); least interorbital breadth, 3.7 (3.3–4.2); breadth of braincase, 11.0 (10.5–11.6); palatal length, 11.7 (10.8–12.7); length of maxillary toothrow, 3.6 (3.3–3.9); length of mandibular toothrow, 3.7 (3.4–4.0); diastema length, 5.9 (5.2–6.4).

Remarks.—This is one of the most common small mammals in forested areas of Salta. Its habitats include mesic forests, gallery forests and old fields in fairly mesic areas. Animals were captured from burrows under rocks and logs or in trees. In northern Salta, specimens were captured in dense cane (*Chusquea*) thickets. These mice are also common along permanent rivers supporting gallery forest in the Monte Desert of the southwestern parts of the province.

A male captured in September in Itiyuro had inguinal testes measuring 7.2 mm in length. Another captured near General Ballivián in late September had scrotal testes measuring 7.7 mm in length, whereas a male captured near Pocoy at about the same time had scrotal testes with a length of 6.9 mm. A female captured with the latter individual evidenced a copulatory plug. In October in far eastern Salta ("El Breal") a pregnant female (five embryos) was captured, whereas a male with large scrotal testes was taken at the same time and a second male with large scrotal testes (9.3 mm in length) was also taken. Two other females captured at about the same time in that locality had embryos (1 embryo equals 12.9 mm crown-rump length; 4 embryos equal 21.6, 19.1, 19.0 mm crown-rump length). Two males taken near Anta in mid-October had scrotal testes of 7.3 mm and 8.0 mm in length, respectively.

Molt in *O. nigripes* is from ventral to dorsal and proceeds caudally (Fig. 12). Of four individuals captured in July, none was molting. One of nine individuals taken in September was molting over 25% of its body, while four of seven animals taken in October were molting over

less than 50% of their body. Ojeda (1980) discusses molt in this species in Tucumán, while Mares (1977*a*) reports on water balance for two populations.

Our designation of this species as *O. nigripes* rather than *O. longicaudatus* follows Hershkovitz (1959) and Wetzel and Lovett (1974).

Akodon andinus (Philippi)
ratón andino — Andean grass mouse

1858. *Mus andinus* Philippi, Arch. Naturg., 23, I:77.
1898. *Akodon andinus* Trouessart, Catal. Mammal., 2:535.

Specimens examined (2).—La Poma: 18 km S jct Hwys 40 and 51, along Hwy 40, 4500 m, 2.

Measurements.—One ♂ and one ♀, respectively: total length, 133, 125; tail, 54, 49; hind foot, 20.2, 19.5; ear, 16.0, 13.8; weight, 18, 13. Cranial measurements: greatest length of the skull, 22.9, 22.2; condylobasal length, 22.5, 20.9; least interorbital breadth, 4.0, 4.1; breadth of braincase, 10.8, 11.3; palatal length, 11.0, 10.1; length of maxillary toothrow, 3.4, 3.3; length of mandibular toothrow, 3.2, 3.8; diastema length, 5.9, 5.3.

Remarks.—This small buffy *Akodon* was only taken at out highest collecting locality at approximately 4500 m. The species is largely diurnal, at least in April (autumn) at this altitude. Both animals were captured on fairly steep rocky hillsides. The male had large scrotal testes (10.7 mm in length), while the female was not breeding. The male was molting primarily on the dorsum (Fig. 13), although we were unable to discern the pattern of molt.

Akodon boliviensis Meyen
ratón plomizo — Bolivian grass mouse

1833. *Akodon boliviensis* Meyen, Verhandl. Kais. Leop. Carol. Akad. Wiss., 16, II:600.

Specimens examined (23).—Capital: Quebrada de San Lorenzo, 12 km NW Salta, 2. Cerrillos: INTA Station, 11. Oran: 24 km NW Aguas Blancas, 10.

Measurements.—Mean and range for 10 individuals: total length, 162.9 (153–183); tail, 76.3 (71–83); hind foot, 22.3 (20.3–24.0); ear, 17.4 (15.5–20.3); weight, 19.4 (14.3–25.5). Cranial measurements of four individuals: greatest length of the skull (N = 1), 25.1; condylobasal length (N = 1), 23.2; zygomatic breadth (N = 2), 12.5, 15.0; least interorbital breadth (N = 2), 4.6, 5.0; breadth of braincase (N = 2), 12.5, 11.0; palatal length, 14.6, 12.2, 12.4, 12.1; length of maxillary toothrow, 4.6, 3.8, 3.7, 4.0; length of mandibular toothrow, 4.9, 4.0, 4.0, 4.1; diastema length (N = 3), 7.9, 7.2, 6.3.

Remarks.—This small dark *Akodon* is one of the commonest rodent species found in Salta, particularly in second growth areas in mesic forest localities. Specimens were taken under rocks and logs, and along streams and road cuts. They are also common in agricultural areas. This species is found throughout the central, low-elevational, moist forested regions of the province, where it co-occurs with the larger *Akodon varius,* and probably with the slightly smaller, buffier *A. caenosus* as well (see Barquez et al., 1980).

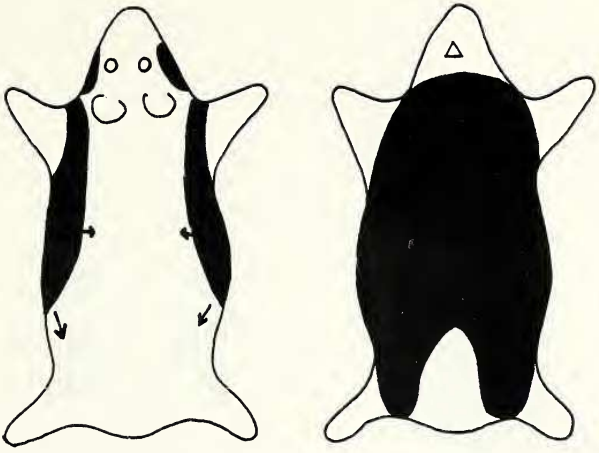

Fig. 12.—Molting pattern in *Oryzomys nigripes*—the venter is completely pigmented with melanin, while molt proceeds dorsally and posteriorly.

Akodon varius Thomas
ratón variado — variable grass mouse

1902. *Akodon varius* Thomas, Ann. and Mag. Nat. Hist., ser. 9, 1:190.

Specimens examined (66).—CAFAYATE: 6 km NE Cafayate, along Hwy 68, 1; 5 km W Cafayate, Yacochuya, 1. CERRILLOS: INTA Station, 13. GENERAL SAN MARTIN: 4 km S Pocoy, 3; 17 km SW, beyond Dique Itiyuro, 17; 20 km W General Ballivián on Puerto Baulés Rd., 13. GUACHIPAS: 20 km S Pampa Grande, along Hwy 9, 3. ORAN: Juntas de San Antonio, 1; 22 km SW Orán, along Río Santa María, 6; 24 km NW Aguas Blancas, 18. RIVADAVIA: 6 km SW of Santa Victoria, at "El Breal," 1.

Measurements.—Mean and range for three ♂♂ and five ♀♀ (from Orán): total length, 190.1 (160–222); tail, 89 (81–103); hind foot, 25.2 (20.8–26.7); ear, 21.5 (20.6–23.2); weight, 39.2 (20–60). Cranial measurements: greatest length of the skull, 28.7 (26.3–30.8); condylobasal length, 26.8 (24.5–28.5); zygomatic breadth, 14.4 (13.7–15.2); least interorbital breadth, 5.2 (5.0–5.8); breadth of braincase, 12.5 (12.1–12.8); palatal length, 13.4 (11.7–15.1); length of maxillary toothrow, 4.8 (4.3–5.3); length of mandibular toothrow, 4.7 (4.2–5.2); diastema length, 7.3 (6.6–8.2).

Remarks.—This species and *O. nigripes* are the most common small mammals over mesic parts of Salta. *Akodon varius* is abundant in second growth portions of forested areas, river banks, stream banks, sugarcane fields, old fields, orchards and grasslands. This is the largest *Akodon* in Salta and co-occurs frequently with *A. boliviensis*, *O. nigripes*, and *C. callosus* (Ojeda, 1979). Individuals are often captured from burrows under logs or rocks or in forest litter. The species is nocturnal. There is much morphological and karyological variation in individuals within and among populations (Barquez et al., 1980).

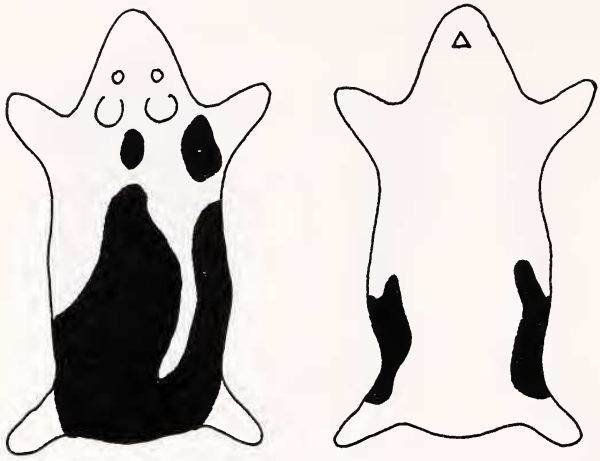

Fig. 13.—Pattern of melanin deposition in a male *Akodon andinus* captured in April at 4500 m elevation.

Of two males taken in April, one had scrotal testes (10.8 mm in length), while the other had abdominal testes (5.1 mm in length). Two females captured at this time were not breeding. One male taken in August had inguinal testes. Of eight males captured in September, five had scrotal testes with lengths of 8.0, 8.7, 9.0, 9.6 and 11.4 mm, respectively, while the other three had inguinal testes of lengths 7.3 and 8.7 mm. In October, of six females, three had closed vaginas, one had a plugged vagina, and one had an open vagina. Of 11 males captured at this time, 10 had scrotal testes with lengths (N = 4) of 5.7, 8.8, 9.3, and 14.6 mm, whereas one had inguinal testes. In November, two females were lactating, one with an open and one with a plugged vagina. Three males taken in this month had scrotal testes and one had inguinal testes.

Molt in *A. varius* proceeds from anterior to posterior and from dorsal to ventral (Fig. 14). Of 10 individuals taken in July, none was molting. Nine of 30 animals were molting in September, with eight having melanin over less than 10% of their surface, while one was molting over more than 10% of its body. Five of 13 animals taken in October were molting: two at a level below 10%, two at about a 25% level, and one at more than 50%. All six specimens examined in November were molting–three at less than 10% and three at greater than 50% levels. One of four animals taken in April, a young individual, was molting over 10% of its body (Fig. 15).

Mares (1975*a*) discusses water balance in this species.

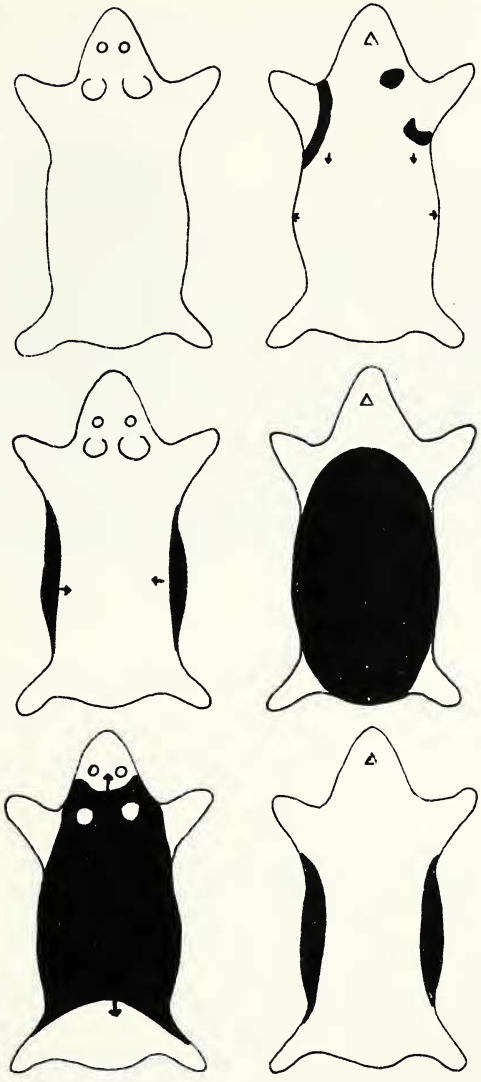

Fig. 14.—Molt pattern in a series of adult *Akodon varius* taken between October and November. Molt begins anteroventrally, proceeds posteriorly, then dorsally and toward the head and tail.

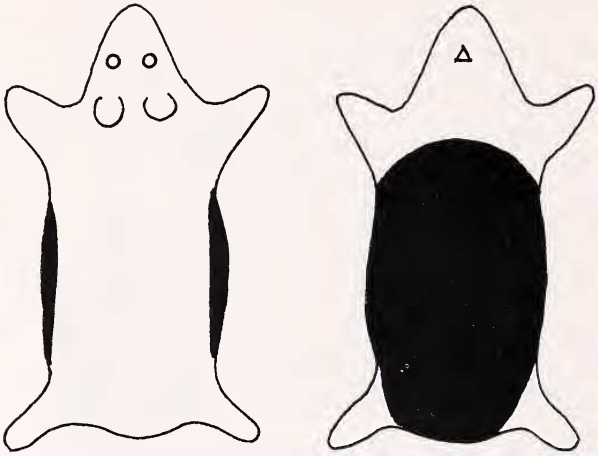

Fig. 15.—Melanin deposits in a young male *Akodon varius* captured near Orán in November. No pattern was discernible, but hair growth may be as in the adults, with our specimen representing the stage of molt immediately preceeding hair growth on the dorsum, as in the middle of Fig. 14.

Akodon albiventer Thomas
ratón ventriblanco — white-bellied grass mouse

1897. *Akodon albiventer* Thomas, Ann. Mag. Nat. Hist., ser. 6, 20:217.

Specimens examined (10).—La Poma: 14 km S jct Hwys 40 and 51, along Hwy 40, 4100 m, 10.

Measurements.—Mean and range of five ♂♂ and three ♀♀: total length, 159.6 (153–170); tail, 71.1 (66–78); hind foot, 21.7 (21.0–22.4); ear, 15.2 (14.0–16.1); weight, 21.4 (16.5–29.5). Cranial measurements: greatest length of the skull, 24.1 (23.2–25.3); condylobasal length, 23.3 (22.6–24.8); zygomatic breadth (N = 3), 14.4 (11.6–13.1); least interorbital breadth, 4.6 (4.4–4.8); breadth of braincase, 11.1 (10.7–11.6); palatal length, 11.5 (10.8–12.2); length of maxillary toothrow, 3.9 (3.8–4.0); length of mandibular toothrow, 4.3 (3.8–5.0); diastema length, 6.2 (5.8–6.6).

Remarks.—This handsome *Akodon* with a white venter occurs at high elevations (>4000 m) in mesic areas. It is not common and is probably limited to the pre-Andean and Andean mountain chains. Individuals were taken in and near a small marsh with very lush vegetation (Fig. 16) in April 1976.

Four females were not in reproductive condition; two males had abdominal testes with lengths of 2.6 and 2.9 mm, respectively; one had inguinal testes with a length of 6.0 mm, and two had scrotal testes with lengths of 5.3 and 7.5, respectively.

Eight of 10 individuals were molting; five had melanin deposits over

Fig. 16.—A marsh located in the Puna at 4000 m elevation near San Antonio de los Cobres. This site contained *Phyllotis darwini, Galea musteloides* and *Auliscomys sublimis*.

25–50% of the skin's inner surface. Molt on all was primarily or totally limited to the dorsum, with only occasional patches of melanin deposited on the venter. Molt proceeds from posterodorsal to anterodorsal (Fig. 17).

Oxymycterus paramensis Thomas
hocicudo parameño — burrowing mouse

1902. *Oxmycterus paramensis* Thomas, Ann. Mag. Nat. Hist., ser. 7, 9:139.

Specimens examined (6).—GENERAL SAN MARTIN: 17 km SW beyond Dique Itiyuro, 500 m, 2. ORAN: 22 km SW Orán, along Río Santa María, 1; 24 km NW of Aguas Blancas, 3.

Measurements.—Mean and range for three ♂♂: total length, 215.3 (192–243); tail, 100 (87–113); hind foot, 29 (28.4–29.6); ear, 20.8 (20.6–21.0); weight, 42 (36.7–52). Cranial measurements: greatest length of the skull, 32.4 (31.4–34.1); condylobasal length, 28.5 (27.7–30.1); zygomatic breadth, 13.9 (13.5–14.4); least interorbital breadth, 6.0 (5.8–6.2); breadth of braincase, 13.5 (13.4–13.5); palatal length, 14.2 (13.4–15.3); length of maxillary toothrow, 5.1 (5.0–5.2); length of mandibular toothrow, 5.4 (5.2–5.6); diastema length, 7.2 (6.9–7.5).

Remarks.—This is one of the most shrew-like of the akodont rodents and inhabits the forest floor in mesic areas of north-central Salta. Some

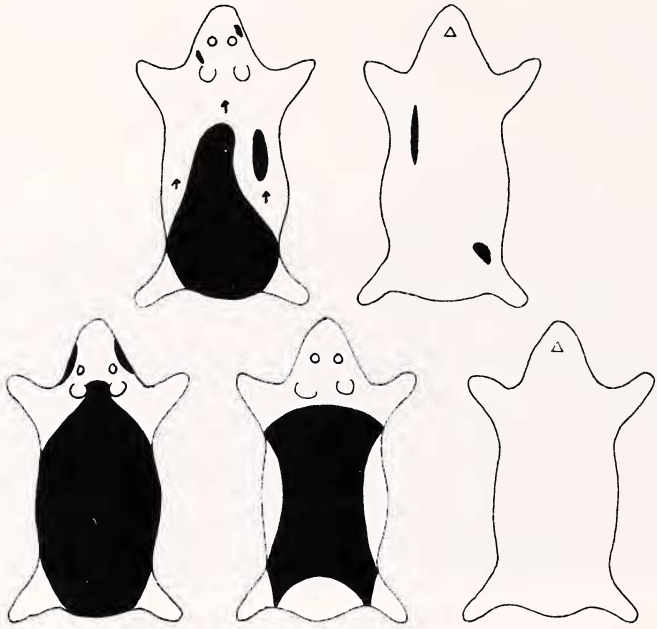

Fig. 17.—Molt in *Akodon albiventer*. Small patches of melanin were visible on the venter, but molt in a series of eight specimens was noted primarily on the dorsum, moving from posterior to anterior (above) and eventually covering the entire animal, with new hair growth occurring in the mid-dorsal region at the end of the molting sequence (bottom).

specimens were taken under logs in dense verdant second growth. One was taken from the sand-rock embankment of the Río Pescado. This is an uncommon species in northwest Argentina and appears to be nocturnal. It probably is limited to the northern wet forests, although it possibly will be found in mesic forest enclosures in central, or even south-central Salta.

Two individuals captured in September were not breeding—one had small abdominal testes, whereas the other had large (10.4 mm length) inguinal testes.

Calomys laucha (Olfers)
laucha chica — vesper mouse

1818. *Mus laucha* Olfers, Eschwege Neue Bibl. Reisenbr., 51:209.
1959. *Calomys laucha* Hershkovitz, J. Mamm., 40:339.

Specimens examined (3).—CAFAYATE: 5 km NE Cafayate, 1. RIVADAVIA: 4 km NE Santa Victoria, 2.

Measurements.—Two ♂♂ and 1 ♀, respectively: total length, 150, 134, 125; tail, 83, 60, 56; hind foot, 19.5, 14.5, 14.8; ear, 16.8, 13.9, 15.6; weight, 10, 18, 18. Cranial measurements of one ♂ and one ♀, respectively: greatest length of the skull, 20.8, 20.3; condylobasal length, 18.9, 18.3; zygomatic breadth, —, 10.9; breadth of braincase, 9.4, 9.6; least interorbital breadth, 3.4, 3.6; palatal length, 10.2, —; length of maxillary toothrow, 2.9, 2.7; length of mandibular toothrow, 3.0, 3.0; diastema length, 5.0, 4.9.

Remarks.—This very small *Mus*-like mouse with a white venter is uncommon, although occurring over much of Salta Province, particularly in dry areas. One specimen was taken in a sandy area of the Monte Desert near Cafayate (see Fig. 9), whereas two were taken in the xeric thorn scrub of far eastern Salta under sparse bushes.

The specimens taken in eastern Salta were caught in October—the female was lactating, and the male had large scrotal testes.

Calomys callosus (Rengger)
laucha grande — large vesper mouse

1830. *Mus callosus* Rengger, Naturg. Saeugeth. Paraguay:231.
1960. *Calomys callosus* Cabrera, Rev. Mus. Argent. Cienc. Natur., Zool., 4, 2: 477.

Specimens examined (22).—ANTA: 21 km N Anta, on El Piquete Rd along Río del Valle, 7. CERRILLOS: INTA Station, 2. GENERAL SAN MARTIN: 4 km S Pocoy, 5; 20 km W General Ballivián, on Puerto Baules Rd., 2. ORAN: 2 km S Juntas de San Antonio, 2; 15 km S Orán, along Río Santa María, 1; 22 km SW Orán, along Río Santa María, 3.

Measurements.—Mean and range for five individuals: total length, 182.8 (175–192); tail, 87.2 (82–92); hind foot, 21.1 (18.8–22.5); ear, 19.5 (18.5–20.5); weight, 30.9 (20–40.9). Cranial measurements (mean and range): greatest length of the skull (N = 4), 26.4 (25.3–29.3); condylobasal length (N = 6), 24.8 (22.8–27.7); zygomatic breadth (N = 3), 14.3 (13.4–15.0); least interorbital breadth (N = 6), 4.4 (4.0–5.2); breadth of braincase (N = 5), 11.4 (10.7–11.7); palatal length (N = 6), 13.6 (13.0–14.8); length of maxillary toothrow (N = 6), 4.1 (3.5–4.7); length of mandibular toothrow (N = 6), 4.2 (3.9–5.0); diastema length (N = 6), 6.6 (6.4–7.4).

Remarks.—This is one of the common rodents in second growth habitats in mesic forested areas, such as stream edges, road cuts, old fields, grassy areas, sugar cane fields, and river banks. Individuals are often captured from burrows under rocks or logs, or from tangled roots. The species does not appear to climb and is nocturnal.

Two females captured in March were pregnant with 8 and 6 embryos, respectively. Three females taken in September were not in breeding condition, whereas, of four males taken at the same time, three had inguinal testes measuring 8.0, 9.1, and 13.5 mm, and one had scrotal testes measuring 9.1 mm in length.

Molt in *C. callosus* begins as isolated patches on the dorsum and venter that move medially in dorsal parts and posteriorly in ventral parts (Fig. 18). In February, nine of 10 individuals had melanin deposits over less than 20% of the surface, whereas one had more than 40% of the surface covered by melanin. Two individuals captured in

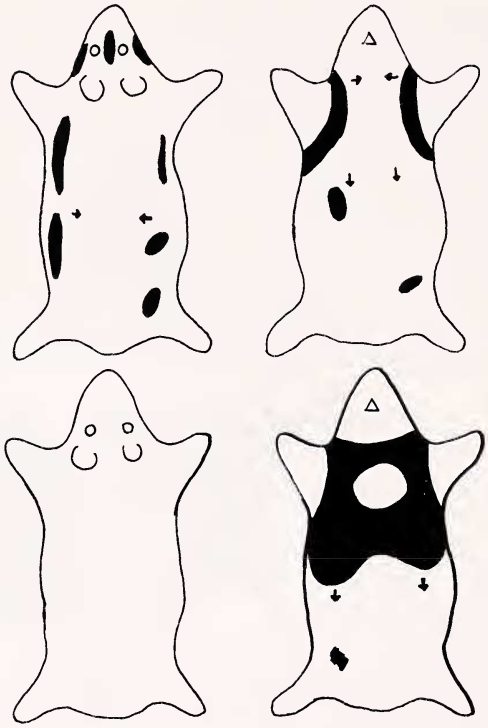

Fig. 18.—Molting pattern in *Calomys callosus*. Isolated patches of melanin indicate molt initiation on both the dorsum and ventrum (above). Hair growth proceeds medially and posteriorly (below).

March were molting over less than 20% of their body, whereas two individuals captured in September were molting over less than 10% of their body.

Eligmodontia typus Cuvier
laucha colilarga bayo — Gerbil mouse

1837. *Eligmodontia typus* Cuvier, Ann. Scienc. Natur., ser. 2, 7:169.

Specimens examined (5).—CAFAYATE: 14 km NE Cafayate, along Hwy 68, 1; 8.2 km NE Cafayate, along Hwy 68, 1; 1 km W Río Santa María, along Hwy 68, 1. LA POMA: 3 km S jct Hwys 40 and 51, along Hwy 40, 4000 m, 2.

Measurements.—Mean and range for one ♂ and two ♀♀ (lowland), followed by those of two ♀♀ (highland): total length, 185 (178–190), 163, 168; tail, 104.3 (104–105), 69, 79; hind foot, 23.2 (22–25), 22.6, 23.4; ear, 20.7 (19.6–22.0), 20.0, 20.8; weight, 18.6 (14.5–22.9), 26.0, 31.1. Cranial measurements of one ♀ (lowland) followed by those of two ♀♀ (highland): greatest length of skull, 25.5, 24.9, 24.9; condylobasal length, 24.8, 22.5,

23.9; least interorbital breadth, 4.3, 4.1, 4.0; breadth of braincase, 11.7, 11.9, 11.9; palatal length, 12.4, 12.4, 11.9; length of maxillary toothrow, 3.8, 3.9, 3.8; length of mandibular toothrow, 3.9, 3.9, 3.8; bullar length (less tubes), 5.7, 4.6, 4.9; diastema length, 5.7, 6.3, 6.1.

Remarks.—This species is limited to the western portions of Salta in the valleys of the Monte Desert and in the high plateau of the Puna. Lowland individuals occur primarily in rolling sand hummocks with halophytic vegetation (for example, Fig. 9), or in creosote bush flats. They are not common in any area of Salta, although they occur regularly in Monte localities. The highland animals are much larger than the lowland form and have shorter tails and longer, laxer pelage. Indeed, the highland form may well be a separate species, although a decision will await larger series of specimens for comparison. *E. typus* probably does not dig its own burrows—it inhabits abandoned tuco-tuco (*Ctenomys*) burrows and those of other rodents as well. This species is one of the most desert-adapted small mammals in Argentina (Mares, 1975*a*, 1975*b*, 1977*b*; Mares, Blair et al., 1977).

A female taken in April 1974 near Cachi had 8 embryos averaging 10.4 mm in crown-rump length, while a second female carried 6 embryos which averaged 5.1 mm in crown-rump length. The species is nocturnal and adapts easily to a laboratory environment (Mares and Mares, in preparation).

Phyllotis darwini (Waterhouse)
pericote panza gris — Darwin's leaf-eared mouse

1837. *Mus darwini* Waterhouse, Proc. Zool. Soc. London:28.
1896. *Phyllotis darwini* Thomas, Proc. Zool. Soc. London:1020.

Specimens examined (10).—CACHI: 35 km E Cachi, approx. 3000 m, 4. LA POMA: 14 km S jct Hwys 40 and 51, along Hwy 40, 4000 m, 1; 14 km S jct Hwys 40 and 51, along Hwy 40, 4100 m, 4; 8 km N La Viñita, along Hwy 40, 1.

Measurements.—Mean and range for four ♀♀: total length, 219.2 (186–251); tail, 106.7 (91–125); hind foot, 25.3 (24.1–26.5); ear, 26.8 (24.6–27.5); weight, 40.7 (25.5–61). Cranial measurements: greatest length of the skull, 29.4 (26.2–31.1); condylobasal length, 28.3 (25.5–30.2); zygomatic breadth, 15.3 (14.5–16.1); least interorbital breadth 4.4 (4.1–4.6); breadth of braincase, 13.3 (13.0–13.7); palatal length, 15.4 (13.9–15.9); length of maxillary toothrow, 5.3 (4.8–6.0); length of mandibular toothrow, 5.3 (4.9–5.8); bullar length, 5.0 (5.0–5.1); diastema length, 7.8 (6.3–8.3).

Remarks.—This well-haired phyllotine is distributed through the hilly and mountainous areas of Salta, particularly in the central and western portions of the province. It inhabits riparian areas in mesic forests as well as gallery forests in lowland deserts when these are along permanent rivers. High desert areas are also frequented, even on the steepest hillsides, as are high Puna localities. The species is always associated with rocks and is probably the most common mammal on the dry bouldery slopes of xeric mountains.

All of our specimens were taken in April. None of five females was breeding, although one had a swollen uterus. One male had small abdominal testes measuring 3.2 mm in length.

Water balance and habitat of this species are described in Mares (1975*b*, 1977*c*).

Auliscomys sublimis (Thomas)
pericote andino — Andean leaf-eared mouse

1900. *Phyllotis sublimis* Thomas, Ann. Mag. Nat. Hist., ser. 7, 6:467.
1932. *Auliscomys sublimis* Gyldenstolpe, Kungl. Sv. Vetensk. Handl., vol. 11, 3:95.

Specimen examined (1).—La Poma: 14 km S jct Hwys 40 and 51, along Hwy 40, 4100 m, 1.

Measurements.—One ♂: total length, 173; tail 55; hind foot, 23.4; ear, 24.0; weight, 38.5. Cranial measurements: greatest length of the skull, 28.3; condylobasal length, 26.8; zygomatic breadth, 15.1; least interorbital breadth, 4.2; breadth of braincase, 12.8; palatal length, 15.3; length of maxillary toothrow, 5.2; length of mandibular toothrow, 5.6; bullar length (less tubes), 4.7; diastema length, 7.7.

Remarks.—This is the most vole-like of the phyllotines found in Salta, having lax pelage and a short tail. The single specimen was taken at night in a mesic seepage area of the Puna (Fig. 18) in a grassy-rocky area. It had scrotal testes of medium length, 9.5 mm. This species has not been reported for Salta before, although Pearson (1958) and Hershkovitz (1962) list specimens from Jujuy Province. See Pearson and Patton (1976) concerning the generic status of this species. See also Reig (1978).

Graomys domorum (Thomas)
pericote pálido — pale leaf-eared mouse

1902. *Eligmodontia domorum* Thomas, Ann. Mag. Nat. Hist., ser. 7, 9:132.
1916. *Graomys domorum* Thomas, Ann. Mag. Nat. Hist., ser. 8, 17:142.

Specimens examined (5).—Anta: 11 km N Anta, on El Piquete Rd, 1. General San Martin: Approx. 4 km S Pocoy, NE Salta, 2; 20 km W General Ballivián, on Puerto Baules Rd, 2.

Measurements.—Mean and range for one ♂ and two ♀♀: total length, 323 (310–337); tail, 175.7 (170–178); hind foot, 31.1 (30.0–31.8); ear, 27.3 (25.5–28.5); weight, 102 (100–104). Cranial measurements: greatest length of the skull (N = 2), 38.5 (37.8–39.3); condylobasal length (N = 3), 35.7 (35.1–37.2); zygomatic breadth (N = 4), 18.3 (17.9–19.1); least interorbital breadth (N = 4), 6.6 (5.9–7.5); breadth of braincase (N = 3), 14.9 (14.1–15.5); palatal length (N = 4), 19.3 (18.4–20.2); length of maxillary toothrow (N = 4), 5.6 (5.2–5.9); length of mandibular toothrow (N = 4), 5.7 (5.4–5.9); bullar length (N = 4), 6.5 (6.0–6.9); diastema length (N = 4), 9.5 (9.0–10.2).

Remarks.—This is the largest phyllotine occurring in Salta, although *Andinomys* may ultimately be found in the province. *Graomys domorum* appears to be limited to the transitional forest occurring on very low mountains in central Salta (Fig. 19), but it may occur in drier

Fig. 19.—The Transitional Forest (site 10) of north-central Salta during the dry season (September). *Graomys domorum* and *Nasua nasua* were captured in this type of habitat.

portions of the subtropical forest that bisects Salta from north to south. Animals were taken in thick grass along road cuts and from second growth areas. Although large rocks were often present, *Graomys* does not seem to be as intimately associated with boulders as is *P. darwini*.

Two females captured in September were not breeding, whereas a male captured at that time had large scrotal testes. A male taken in October had scrotal testes 9.7 mm in length.

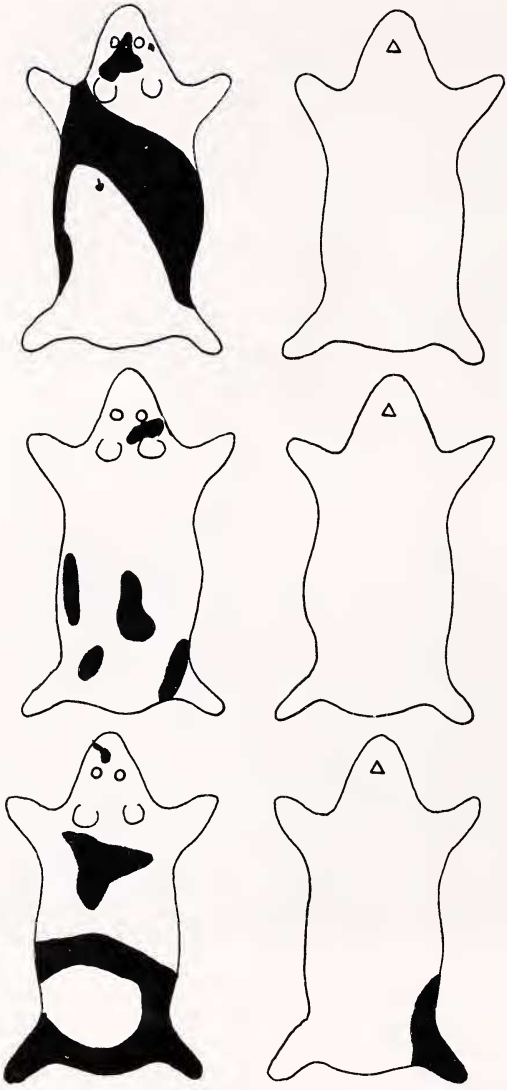

Fig. 20.—Melanin patterns evident on several *Graomys griseoflavus*. Little molting was detected on the ventrum, with broad bands or isolated patches of hair growth being noted on the dorsum.

Graomys griseoflavus (Waterhouse)
pericote común — gray leaf-eared mouse

1837. *Mus griseoflavus* Waterhouse, Proc. Zool. Soc. London:28.
1916. *Graomys griseoflavus* Thomas, Ann. Mag. Nat. Hist., ser. 8, 17:142.

Specimens examined (30).—ANTA: 3 km N of Ceibalito, on jct of Anta Rd. and Hwy 16, 1; 21 km N of Anta, 1. CACHI: 5 km S (by rd.) of jct of Seclantás Rd. and Hwy 59 (about 30 km E Cachi), 2600 m, 2; 30 km S Cachi, 4. GENERAL SAN MARTIN: 27 km E Tartagal, 3. RIVADAVIA: 4 km NE Santa Victoria, 6; 2 km W Santa María, 5; 6 km SW Santa Victoria, at "El Breal" (extreme NE Salta), 7. SAN CARLOS: 8 km N La Viñita, along Hwy 40, 1.

Measurements.—Mean and range for two ♂♂ and six ♀♀: total length 271.7 (213–320); tail, 153.1 (125–177); hind foot, 28.0 (25.5–29.5); ear, 25.0 (21.6–29.5); weight, 62.5 (38–72). Cranial measurements: greatest length of the skull, 32.8 (31.5–35.1); condylobasal length, 29.9 (27.3–31.7); zygomatic breadth, 16.3 (13.6–19.0); least interorbital breadth, 5.3 (4.7–5.9); breadth of braincase, 14.2 (13.2–15.2); palatal length, 16.7 (14.3–18.4); length of maxillary toothrow, 5.5 (5.1–6.0); length of mandibular toothrow, 5.3 (4.8–6.0); bullar length, 6.2 (5.6–7.0); diastema length, 8.2 (7.7–8.8).

Remarks.—This aggressive, strong phyllotine occurs widely throughout the drier middle and lower portions of Salta. It is regular in *Prosopis* areas (Mares, Enders et al., 1977) where it feeds on the leaves and pods of the tree and occasionally takes insects as well. We have never taken this species in very mesic localities, nor at the highest localities. It may be associated with boulders on hillsides or along flowing rivers with associated gallery forests, but it also may spend most of its time in trees. The animals also frequent cultivated areas such as vineyards and orchards.

All specimens were captured in April, September, or October. One April female was not breeding, whereas two were lactating. Both males examined in April had inguinal testes of lengths 5.2 and 8.1 mm, respectively. Four September males had large scrotal testes. One October female was not breeding; three had vaginas with copulatory plugs; and two had open vaginas. Two October males had large scrotal testes.

Two of seven April animals were molting at less than the 10% level. Two of six September specimens were molting over 10–15% of their body, whereas all 11 October specimens were molting over 10–50% of their body. We were unable to discern a pattern in hair replacement and it appears quite variable (Fig. 20), although it seems to begin dorsally.

Water balance, habits, and habitat of this species are discussed by Mares (1975*a*, 1975*b*, 1976, 1977*c*; Mares, Blair et al., 1977, Mares and Hulse, 1977, and Mares, Enders et al., 1977).

Fig. 21.—The shrub in the center of the photograph is about 2 m high and contained nests of *Holochilus brasilensis*. The animals were seen climbing throughout this and similar shrubs and were captured in traps set at the base of the bushes. These shrubs were located near the lagoon shown in Fig. 5, being found perhaps 30 m from the water's edge.

Holochilus brasiliensis (Desmarest)
rata nutria o rata colorada — marsh rat

1819. *Mus brasiliensis* Desmarest, Nov. Dict. Hist. Nat., 2nd ed., 29:62.
1897. *Holochilus brasiliensis* Thomas, Ann. Mag. Nat. Hist., ser. 6, 19:496.

Specimens examined (31).—ORAN: Juntas de San Antonio, 1. RIVADAVIA: 6 km SW Santa Victoria, at "El Breal" (extreme NE Salta), 30.

Measurements.—Mean and range for 10 individuals (five ♂♂ and five ♀♀): total length, 329.8 (284–381); tail, 161.2 (140–192); hind foot, 39.6 (35.2–42.7); ear, 21.8 (20.8–23); weight, 146.9 (81–230). Cranial measurements (mean and range for three ♂♂ and four ♀♀, respectively): greatest length of the skull, 35.9 (34.0–38.6), 36.1 (35.3–37.1); condylobasal length, 34.3 (32.2–37.2), 34.0 (33.7–34.5); zygomatic breadth, 20.2 (19.4–21.2), 20.2 (19.9–20.7); least interorbital breadth, 4.7 (4.5–4.9), 4.8 (4.4–5.2); breadth of braincase, 14.2 (13.6–14.7), 14.1 (13.4–14.9); palatal length, 20.9 (20.0–22.3), 20.5 (19.8–21.1); length of maxillary toothrow, 6.9 (6.5–7.2), 7.0 (6.7–7.1); length of mandibular toothrow, 7.2 (7.1–7.3), 7.0 (6.7–7.3); diastema length, 10.4 (9.5–11.5), 10.5 (10.3–10.8).

Remarks.—This large sigmodont rodent is common throughout the lower mesic elevations of Salta Province, particularly in cultivated sugar cane fields. The species is usually at least semiaquatic and pos-

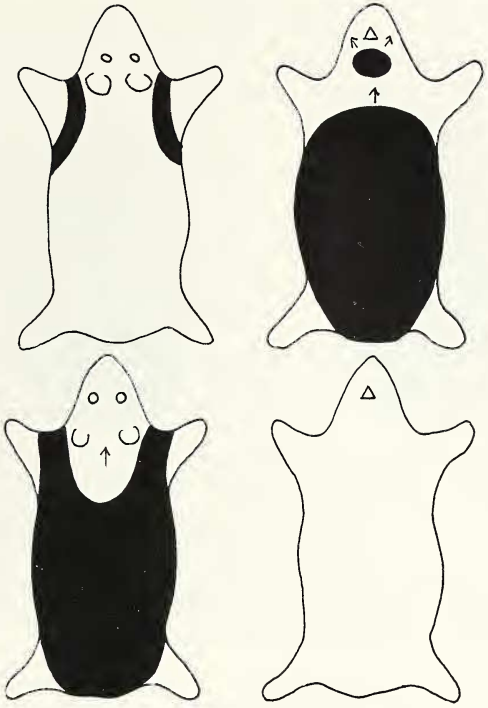

Fig. 22.—Molting pattern in *Holochilus brasilensis* captured in October. Molt proceeded from ventrum to dorsum (above), with the hair of the head being replaced last, after ventral growth was completed (below).

sesses some webbing on the hind feet. It is common along canals and rivers in agricultural areas. Curiously, almost all of our specimens were taken from the dry chaco of eastern Salta near a stagnant salty lake. The *Holochilus* were nesting in low (2 m) shrubs and were very common in the area (Fig. 21). They probably arrived at the site from the Rio Pilcomayo during periods of general inundation.

The series from eastern Salta was taken in October 1976, at the end of the dry season in that area. All of the adult males examined (eight) had scrotal testes; one had testes measuring 18.6 mm in length, whereas most of the others had scrotal testes varying from small to medium. All but one of the females examined (20 in total) had vaginas that were either open or sealed with a copulatory plug. One female had a closed vagina. Two were pregnant with 3 and 4 embryos, respectively. The latter's embryos measured 3.0 mm in crown-rump length.

Eight individuals were examined for molt, three ♂♂ and five ♀♀.

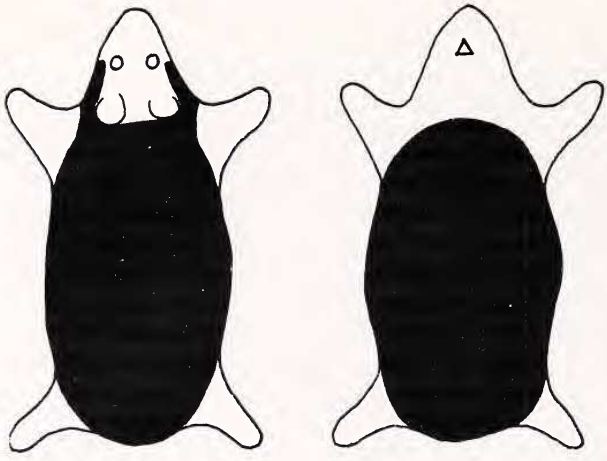

Fig. 23.—Melanin deposition pattern in a female *Microcavia australis* captured in April. Hair growth was occurring over the entire body.

All males were molting between 30–80% of their body, whereas the females showed only small patches of melanin deposited behind the ears and eyes (Fig. 22).

Family Caviidae

Microcavia australis (Geoffroy and D'Orbigny)
cuis chico — southern cavy

1833. *Cavia australis* Geoffroy & D'Orbigny, Magas. de Zool., 3.
1907. *Microcavia australis* Kraglievich, Physis, 8:578.

Specimens examined (2).—CACHI: 10 km E of Cachi, 1; 25 km E of Cachi, 1.

Measurements.—One ♂ and two ♀, respectively: total length, 210, 104; tail, 0, 0; hind foot, 47.5, 35.2; ear, 22.4, 17.4; weight, 326, 66. Cranial measurements: greatest length of the skull, 49.1, 34.1; condylobasal length, 46.4, 30.1; zygomatic breadth, 30.4, 19.8; least interorbital breadth, 11.1, 9.6; palatal length, 24.0, 14.5; length of maxillary toothrow, 11.8, 7.9; length of mandibular toothrow, 12.1, 9.2; diastema length, 13.1, 7.8.

Remarks.—This tail-less, medium-sized caviid is common in the western lowlands of Salta in the valleys of the Monte Desert (Fig. 9). We doubt that *Microcavia* occurs with any frequency outside of the arid valleys of western Salta. Two specimens of *Microcavia* are listed in The Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" as being taken from El Quebrachal and from Dragones. Both of these localities are in the westerly portion of the Chaco thorn forest of Salta. The site located further east (Dragones) is near the Río Ber-

mejo and it is possible that populations may exist within the corresponding gallery forest. Nevertheless, in travelling widely throughout eastern Salta, we did not see any individuals in the thorn scrub. Specimens in western Salta were taken from burrows under low shrubs (for example, *Larrea, Plectrocarpa*), as well as from burrows placed under fallen trees (especially *Prosopis*). These rodents are agile climbers and spend a great part of their time climbing in *Prosopis* trees where they feed on the leaves. When startled, they will leap or fall clumsily to the ground and scurry away to their burrows. Many animals inhabit a single burrow system. They are most common in sandy areas, or in areas of clayey soil; they are particularly common along gallery forests of desert gullies, or in *Prosopis* forests in areas with a high water table. The species has been studied in detail by Rood (1970, 1972). Additional information is available in Mares (1973, 1975*a*), Mares, Blair et al. (1977), and Mares, Enders et al. (1977).

The male taken in April 1974 (autumn, dry season) had large scrotal testes (26.5 mm in length), whereas the female captured at this time was not breeding.

The female was molting over the entire body (Fig. 23).

Galea musteloides Meyen
cuis común — common cavy

1832. *Galea musteloides* Meyen, Nova Acta Ac. Gaes, Leop. Car., 16:597.

Specimens examined (2).—CERRILLOS: INTA Station, 1. LA POMA: 14 km S jct Hwys 40 and 51, along Hwy 40, 4100 m, 1.

Measurements.—One ♂ and one ♀, respectively: total length, 198, 170; tail, 0, 0; hind foot, 38.9, 42.0; ear, 21.4, 22.7; weight, 243, 192. Cranial measurements: greatest length of the skull, 51.1, 47.3; condylobasal length, 48.1, 43.3; zygomatic breadth, 29.4, 25.7; least interorbital breadth, 10.7, 10.5; breadth of braincase, 19.8, 20.3; palatal length, 25.3, 21.9; length of maxillary toothrow, 11.8, 10.5; length of mandibular toothrow, 11.3, 10.1; diastema length, 14.0, 12.1.

Remarks.—This medium-sized caviid inhabits the far western thorn scrub of Salta, particularly in the foothills supporting Transitional Forest, the mesic subtropical forest, and in the high Puna. In Salta it seldom coexists with *Microcavia*, although these species do coexist in other localities (see, for example, Contreras, 1965, 1966; Rood, 1970, 1972). Generally, *Galea* in Salta is most common in moist microhabitats, such as croplands, stream edges, forest edges, road cuts, and orchards. Burrows are similar to *Microcavia*, although *Galea* does not seem to climb trees as does *Microcavia*.

The female taken at 4100 m in April of 1974 was lactating, whereas a male taken in October near the town of Cerrillos had large scrotal testes.

Pediolagus salinicola (Burmeister)
conejo del palo — Chacoan cavy

1875. *Dolichotis salinicola* Burmeister, Proc. Zool. Soc. London:634.
1935. *Pediolagus salinicola* Yepes, Rev. Inst. Bacteriol., 7:245.

Specimens examined (6).—RIVADAVIA: 5 km W Santa María, 1; 5 km SE Santa María, 1; 4 km NE Santa Victoria, 3; 1 km W Santa María, 1.

Measurements.—Mean and range for three ♂♂ and two ♀♀: total length, 443.3 (420–470); tail, 23.6 (19–30); hind foot, 97.1 (91–100.2); ear, 60.5 (56.7–64.6); weight, 1890 (1500–2200). Cranial measurements (N = 4): greatest length of the skull, 86.7 (81.7–90.7); condylobasal length, 79.3 (77.4–81.7); zygomatic breadth, 43.3 (40.2–45.0); least interorbital breadth, 25.1 (25.5–24.8); breadth of braincase, 34.0 (33.0–34.6); palatal length, 37.5 (34.4–40.7); length of maxillary toothrow, 16.7 (14.8–19.2); length of mandibular toothrow, 16.9 (15.6–19.0); diastema length, 24.6 (23.7–25.6).

Remarks.—This is the largest caviid in Salta and inhabits the most arid sections of the low, flat thorn scrub of the eastern part of the province. They are very rabbit-like in external appearance and in the overall aspect of the cranium. Animals are often found in pairs; they dig large burrows throughout the thorn scrub and are particularly common in areas supporting tall *Prosopis* (Fig. 6).

Four of the specimens taken in October 1976 were breeding. Two females were pregnant with 2 embryos each, one in each uterine horn. Two males had large scrotal testes measuring 39.6 and 45.6 mm, respectively.

None of the animals was molting.

Family Hydrochoeridae

Hydrochoerus hydrochaeris (Linné)
carpincho — capybara

1766. *Sus hydrochaeris* Linné, Syst. Nat., 12th ed.:103.
1904. *Hydrochoerus hydrochaeris* J. A. Allen, Bull. Amer. Mus. Nat. Hist., 20:444.

Remarks.—Capybaras are the largest rodents in the world. They are largely aquatic and inhabit the larger rivers in mesic portions of northern Salta. Capybara tracks were seen in the Río Tarija near the confluence of the Ríos Tarija and Pilcomayo.

Family Dasyproctidae

Dasyprocta punctata Gray
aguti rojizo — agouti

1842. *Dasyprocta punctata* Gray, Ann. Mag. Nat. Hist., ser. 1, 10:264.

Remarks.—Agoutis inhabit the moist forest of central Salta, where they extend from the low river valleys to the forested hillsides. Several individuals were seen near the Río Pescado, 24 km NW of Aguas Blancas.

Fig. 24.—Burrow of *Lagostomus maximus* near Tolloche in southeastern Salta. Large areas are cleared of vegetation by these rodents, which subsequently must forage over a larger area. The burrow in the center of the photograph measures over 50 cm across the opening. *Prosopis* and *Acacia* trees surround the mound system.

Family Chinchillidae

Lagostomus maximus (Desmarest)
vizcacha — plains viscacha

1817. *Dipus maximus* Desmarest, Nouv. Dict. Hist. Nat., 2nd ed., 13:117.
1914. *Lagostomus maximus* Hollister, Proc. Biol. Soc. Washington, 27:58.

Specimens examined (2).—RIVADAVIA: 5 or 6 km SW of Santa Victoria, at "El Breal" (extreme NE of Salta), 2.

Measurements.—Two ♀♀: total length, 591, 595; tail, 170, 140; hind foot, 121.8, 118.4; ear, 58.3, 52.7; weight, 3450, 3150. Cranial measurements: greatest length of the skull, 107.4, 86.7; condylobasal length, 95.8, 79.4; zygomatic breadth, 61.2, 52.9; least interorbital breadth, 28.8, 24.4; breadth of braincase, 38.3, 35.5; palatal length, 58.2, 45.1; length of maxillary toothrow, 24.8, 21.2; length of mandibular toothrow, 25.3, 21.9; diastema length, 33.3, 25.4.

Remarks.—This is the largest non-aquatic rodent occurring in Salta. It is common throughout the eastern half of the province in the arid and semiarid lowlands of the Chaco. *Lagostomus* are colonial, burrowing animals and excavate an extensive system in the thorn scrub from which they forage for green vegetation (Fig. 24). As they consume

more and more plants in the immediate vicinity, the animals must travel further to obtain food, until they are travelling 100 m or more. They are nocturnal and extremely wary, taking refuge in their burrow at the slightest disturbance. They will hurry back to the burrow openings and peer outward over the area until they feel free to re-emerge to resume foraging. They issue deep grunts when alarmed. Llanos and Crespo (1952) provide much information on *Lagostomus*.

A female captured in October 1976 was pregnant with 2 embryos.

Lagidium viscacia (Molina)
vizcacha serrana — mountain viscacha

1782. *Lepus viscacia* Molina, Sagg. Stor. Nat. Chili:307.
1919. *Lagidium viscaccia* Thomas, Ann. Mag. Nat. Hist., ser. 9, 3:500.

Remarks.—These rabbit-like diurnal rodents inhabit the boulder strewn slopes and ridges of the arid mountains of western Salta. We observed *Lagidium* at 4000 m near San Antonio de Los Cobres.

Family Ctenomyidae

Ctenomys frater Thomas
tucu-tuco colorado — forest tucu-tuco

1919. *Ctenomys frater* Thomas, Ann. Mag. Nat. Hist., ser. 7, 9:228.

Specimens examined (2).—ORAN: 22 km SW Orán, along Río Santa María, 1; 24 km NW of Aguas Blancas, 1.

Measurements.—Two ♀♀: total length, 244, 251; tail, 72, 77; hind foot, 38.0, 38.5; ear, 11.3, 9.4; weight, 204, 234. Cranial measurements: greatest length of the skull, 43.4, 42.1; condylobasal length, 43.2, 41.1; zygomatic breadth, 28.8, 26.7; least interorbital breadth, 10.8, 9.5; breadth of braincase, 17.7, 18.5; palatal length, 22.9, 22.4; length of maxillary toothrow, 12.0, 9.7; length of mandibular toothrow, 12.2, 10.1; diastema length, 11.4, 12.4.

Remarks.—This is an uncommon tucu-tuco limited to the most mesic forests in north-central Salta Province. The species inhabits flat areas with deep soil, often near small creeks. They do not appear to burrow as extensively as some of the desert species of *Ctenomys*, nor do they appear to be as vocal.

Ctenomys opimus Wagner
tucu-tuco tojo — highland tucu-tuco

1848. *Ctenomys opimus* Wagner, Arch. Naturg., 1:75.

Specimens examined (1).—LA POMA: 12 km S jct Hwys 40 and 51, along Hwy 40, (4000 m), 1.

Measurements.—One ♂: total length, 280; tail, 82; hind foot, 41.0; ear, 9.8; weight, 404. Cranial measurements: greatest length of the skull, 49.1; condylobasal length, 49.4; zygomatic breadth, 32.7; least interorbital breadth, 11.7; breadth of braincase, 19.7; palatal length, 27.7; length of maxillary toothrow, 9.8; length of mandibular toothrow, 10.5; diastema length, 15.8.

Remarks.—This large gopher-like rodent is only found in the high Andean steppe, or Puna (Fig. 8). The animals are very common in the low shrubs that are characteristic of the puna of about 4000 m altitude, such as *Parastrephia, Fabiana, Psila,* and *Adesmia.* Pearson (1959) discusses various aspects of the biology of this species in Peru.

Ctenomys saltarius Thomas
tucu-tuco salteño — Salta tucu-tuco

1912. *Ctenomys saltarius* Thomas, Ann. Mag. Nat. Hist., ser. 8, 10:639.

Specimen examined (1).—SAN CARLOS: 8 km N La Viñita, along Hwy 40, 1.
Measurements.—One ♀: total length, 283; tail, 80; hind foot, 37.5; ear, 10.3; weight, 230. Cranial measurements: greatest length of the skull, 42.7; condylobasal length, 42.2; zygomatic breadth, 28.1; least interorbital breadth, 9.4; breadth of braincase, 18.5; palatal length, 21.6; length of maxillary toothrow, 11.3; length of mandicular toothrow, 11.3; diastema length, 11.0.

Remarks.—This medium-sized burrowing rodent inhabits the hillsides and valleys of the northern Monte Desert. They are especially common in creosote bush (*Larrea cuneifolia*) flats and in areas with *Prosopis* on soft, friable soil. *Ctenomys* feeds on creosote bush and other small shrubs (see Mares and Hulse, 1977) by opening its burrows at the base of the shrub and cutting stems just above ground level. This species vocalizes readily and its thumping calls can be heard throughout the northern Monte, day or night.

One female captured in April was molting on the dorsum (Fig. 25), although we could not discern a pattern.

Ctenomys sp.

Remarks.—We observed burrows and mounds of a tucu-tuco near Estación Tonono in eastern Salta. This level thornscrub habitat is characteristic of *C. mendocinus* in the Chaco Forest of north-central Argentina. Although we did not capture any individuals, we surmise that *C. mendocinus* is the only tucu-tuco in that area.

Order Carnivora

Family Canidae

Cerdocyon thous (Linné)
zorro de monte — crab-eating fox

1766. *Canis thous* Linné, Syst. Nat. 12th ed.:60.
1914. *Cerdocyon thous* Thomas, Ann. Mag. Nat. Hist., ser. 8, 13:356.

Remarks.—This small dark fox is common throughout much of the forested portions of Salta. We have seen individuals in the region of Orán, as well as in the dry Chaco near Joaquín V. Gonzalez.

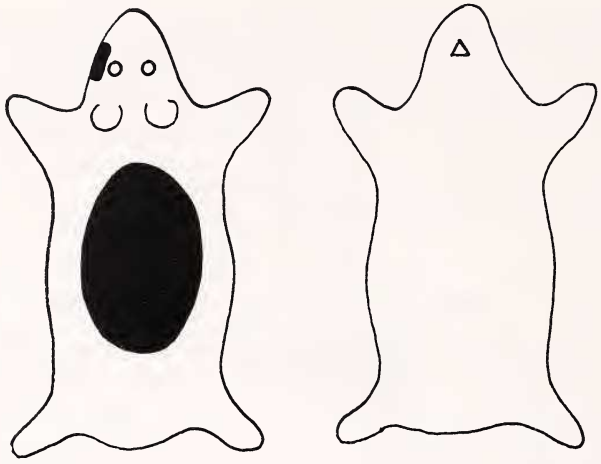

Fig. 25.—Melanin deposits in a *Ctenomys saltarius* captured in April (late autumn). No pattern of hair replacement was evident and melanin was found primarily in the mid-dorsal region.

Family Procyonidae

Nasua nasua (Linné)
coatí — coati

1766. *Viverra nasua* Linné, Syst. Nat., 12th ed.:64.
1900. *Nasua nasua* Berg, Comunic. Mus. Nac. Buenos Aires, 1:219.

Specimen examined (1).—GENERAL SAN MARTIN: 15 km W General Ballivián, on Puerto Baules Rd., 1.

Measurements.—One ♀: total length, 780; tail, 385; hind foot, 87.3; ear, 42.5; weight, 1.400. Cranial measurements: greatest length of the skull, 107.7; condylobasal length, 101.7; zygomatic breadth, 48.5; least interorbital breadth, 20.4; breadth of braincase, 42.3; palatal length, 66.6; length of maxillary toothrow, 29.0; length of mandibular toothrow, 37.6; breadth across canines, 13.0; breadth across last molars, 16.3.

Remarks.—This procyonid is limited to the Transitional Forest and the Moist Forest in north-central Salta, where it is uncommon. The specimen we collected was moving along a dry riverbed in the daytime.

Family Mustelidae

Eira barbara (Linné)
hurón mayor — tayra

1758. *Mustela barbara* Linné, Syst. Nat.:46.
1940. *Eira barbara* Cabrera y Yepes, Mamif. Sud-Americ.:144.

Remarks.—Only one of these large mustelids was seen in Salta as it ran across a road near the confluence of the Ríos Tarija and Bermejo.

Family Felidae

Felis yagouaroundi Geoffroy
gato eyra — jaguarundi

1803. *Felis yagouaroundi* Geoffroy, Catal. Mammif. Mus. d'Hist. Nat.:124.

Remarks.—One of these small cats (a black color phase) was seen along the Río Pescado, 24 km NW of Aguas Blancas in the Moist Forest.

Leo onca (Linné)
yaguareté — jaguar

1758. *Felis onca* Linné, Syst. Nat.:42.
1957. *Leo onca* Cabrera, Rev. Mus. Argent. Cienc. Natur., Zool., 4:299.

Remarks.—Tracks of a jaguar were seen along the Río Pescado, 24 km NW of Aguas Blancas in the Moist Forest, where the animal had killed a tapir.

Order Perissodactyla

Family Tapiridae

Tapirus terrestris (Linné)
tapir — tapir

1758. *Hippopotamus terrestris* Linné, Syst. Nat.:74.
1867(1868). *Tapirus terrestris* Gray, Proc. Zool. Soc. London:879.

Remarks.—Tracks of tapirs were seen along the Río Pescado, 24 km NW of Aguas Blancas. The tapir is the largest mammal in Salta and inhabits major rivers in the mesic northern portion of the province.

Order Artiodactyla

Family Tayassuidae

Tayassu tajacu (Linné)
pecarí de collar — collared peccary

1758. *Sus tajacu* Linné. Syst. Nat.:50.
1903 (1904). *Tayassu tajacu* Thomas, Proc. Zool. Soc. London:242.

Specimens examined (4, skulls only).—GENERAL SAN MARTIN: 4 km S Pocoy, 4.
Measurements.—No external measurements available.

Remarks.—Collared peccaries are common in the low mountains and flatlands of the eastern portion of Salta where they occur in sympatry with *Catagonus wagneri* (Olrog et al., 1976; Wetzel, 1977). They occur in Chaco Forest, Transitional Forest, and Moist Forest. They are heavily hunted for food and for their hide. In 1977, 3000 peccary hides (*D. tajacu, Tayassu pecari,* and *C. wagneri,* probably) were

exported from Salta Province. Between 1972 and 1979, 310,372 peccary hides were exported from Argentina (Ojeda, unpublished manuscript).

Family Cervidae

Mazama gouazoubira (G. Fischer)
corzuela parda — brownish brocket deer

1814. *Cervus gouazoupira* G. Fischer, Zoognosia, 3:465.
1951. *Mazama gouazoubira* Hershkovitz, Fieldiana Zool., 31:567.

Remarks.—This medium-sized deer is a very common inhabitant of the Chaco thorn forest. We saw many individuals throughout the lowland Chaco of northeastern Salta and near the edge of the Transitional Forest in the northeast.

Family Camelidae

Lama glama (Linné)
llama — llama

1758. *Camelus glama* Linné, Syst. Nat.:65.
1891. *Lama glama* Thomas, Proc. Zool. Soc. London:387.

Remarks.—Domestic llamas are common in all of the highlands of Salta, and are also found in some parts of the Monte Desert. They are used for their wool and as beasts of burden.

Lama guanicoe (Muller)
guanaco — guanaco

1776. *Camelus guanicoe* Muller, Linné, Natursyst., Suppl.:50.
1921. *Lama guanicoe* Osgood, Jour. Mamm., 2:39.

Remarks.—Guanacos are common only in the highest Puna elevations, usually above 3500 m. They are heavily hunted for their fur and are also eaten. We saw guanacos above Cachi and near San Antonio de Los Cobres.

Discussion

Salta Province possesses a complex mammal fauna primarily because of its relatively tropical location and the confluence of various major habitats within its provincial boundaries. Nine orders, 29 families, 89 genera, and about 142 species of mammals occur within the borders of Salta. In this report we have emphasized the broad diversity of the mammals of Salta, as well as their habitat selection. Our very limited field time was spent in such a manner that we were able to garner some indication of the overall makeup of the mammal fauna of the province. Obviously much more extensive work must be done in

order to arrive at a better approximation of the actual faunal composition of Salta's mammals. Nevertheless, it is apparent that this region is faunistically important, particularly since many species reach their southern limits within the province. *Tonatia sylvicola, Phyllostomus discolor, Glossophaga soricina, Alouatta caraya, Bradypus boliviensis, Sciurus ignitus, Oryzomys legatus, Coendu prehensilis, Dasyprocta punctata,* and several other species occurring in the moist forest reach their current southern limits in central Salta. In historic times, it is likely that some of these extended southward as far as Tucumán, or even Catamarca, provinces, but habitat modification to the south of Salta has extirpated many forest species.

The distributional patterns of the species discussed in this report are summarized in Table 1. Few species are limited to one major habitat (13 of 58), although each of our five macrohabitats contains at least one species whose range within Salta is limited to that particular habitat type. Most species occur within two habitat types, although a few may be found in three, or even four, of the five macrohabitats. None occurs in all five habitat types, which is an illustration of the great habitat diversity within the province and the distinctiveness of the macrohabitats one from the other. The two most physiognomically similar habitats, that is the Chaco Transitional Forest and the Moist Forest, share the greatest number of species. The Transitional Forest and the Chacoan Thorn Scrub support the greatest number of species (35 and 32, respectively), while the Puna (13 species) and the Precordillera (15 species) support the fewest. The Moist Forest supports an intermediate number of species (29).

The most common mammals within the province are rodents, bats, marsupials, and edentates. Wtihin any of the principal macrohabitats, individuals from these groups predominate as far as frequency of occurrence, and probably also from the standpoint of biomass. This is particularly true because of the abundance of large caviomorph rodents in most habitats, and the abundance of edentates in most portions of the province.

Our determinations of commonness or rareness are entirely subjective, but we list these impressions because of the pronounced effects of commercial and sport hunting pressures and habitat modification upon the mammals of Salta. A large segment of the mammal fauna of the province is in danger of being extirpated, and no effective conservation measures are currently underway. No detailed ecological investigation of any species has ever been conducted within the provinces of Salta, Jujuy, Tucumán, Santiago del Estero, Chaco, San Juan, or La Rioja. Without a basis in ecological studies, effective management practices, should these be attempted, will be greatly impeded. There are few places on earth where one can travel from lush tropical

Table 1.—*Habitat affinities within Salta Province of the 58 species of mammals discussed in this report. "X" indicates that a species occurs within a particular habitat, while "(X)" denotes probable occurrence within a particular habitat. "X'" indicates a species which occurs only within one particular macrohabitat.*

Species	Major habitat type				
	Puna	Pre-cordillera Monte Desert	Humid forest	Transi-tional forest	Chacoan thorn scrub
Marmosa pusilla		X			X
Marmosa elegans			X	X	X
Lutreolina crassicaudata			X		
Didelphis albiventris		X	X	X	X
Artibeus jamaicensis			X	X	
Sturnira lilium			X	X	
Desmodus rotundus		(X)	X	X	X
Myotis albescens					X
Myotis nigricans			X	X	
Myotis levis		X		X	(X)
Eptesicus furinalis				X	
Histiotus montanus	(X)			X	X
Lasiurus borealis	(X)	X	X	X	X
Tadarida laticaudata			X	X	
Eumops bonariensis			X	X	X
Molossops temminckii				X	X
Molossus molossus				X	X
Tamandua tetradactyla				X	X
Chaetophractus vellerosus	X	X			X
Euphractus sexcinctus					X'
Tolypeutes matacus					X'
Dasypus novemicinctus			X	X	
Oryzomys nigripes			X	X	X
Oryzomys legatus			X	X	
Akodon albiventer	X'				
Akodon andinus	X'				
Akodon boliviensis			X	X	
Akodon varius		X	X	X	X
Oxymycterus paramensis			X	X	
Calomys callosus		X	X	X	X
Calomys laucha		X			X
Eligmodontia typus	X	X			
Graomys griseoflavus		X			X
Graomys domorum				X'	
Phyllotis darwini	X	X			
Auliscomys sublimis	X'				
Holochilus brasiliensis			X		X
Ctenomys sp.				X	
Ctenomys frater			X'		
Ctenomys opimus	X'				
Ctenomys saltarius		X'			
Lagostomus maximus					X'
Lagidium viscacia	X'				

Table 1.—*Continued.*

Species	Major habitat type				
	Puna	Pre-cordillera Monte Desert	Humid forest	Transi-tional forest	Chacoan thorn scrub
Microcavia australis		X			X
Galea musteloides	X		X	X	X
Pediolagus salinicola					X′
Hydrochoerus hydrochaeris			X	X	X
Dasyprocta punctata			X	X	
Nasua nasua			X	X	
Eira barbara			X	X	
Cerdocyon thous			X	X	X
Felis yagouaroundi			X	X	X
Leo onca			X	X	X
Tapirus terrestris			X	X	
Tayassu tajacu			X	X	X
Lama glama	X′				
Lama guanicoe	X	X			
Mazama gouazoubira				X	X

forest supporting tapirs, primates, toucans, and jaguars and, within less than 100 air miles, be in a desert with columnar cacti, xeric-adapted mice, and Andean condors. Salta Province is such a place, and the further deterioration of the marvelous environmental complexity of the province will be an immeasurable loss.

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